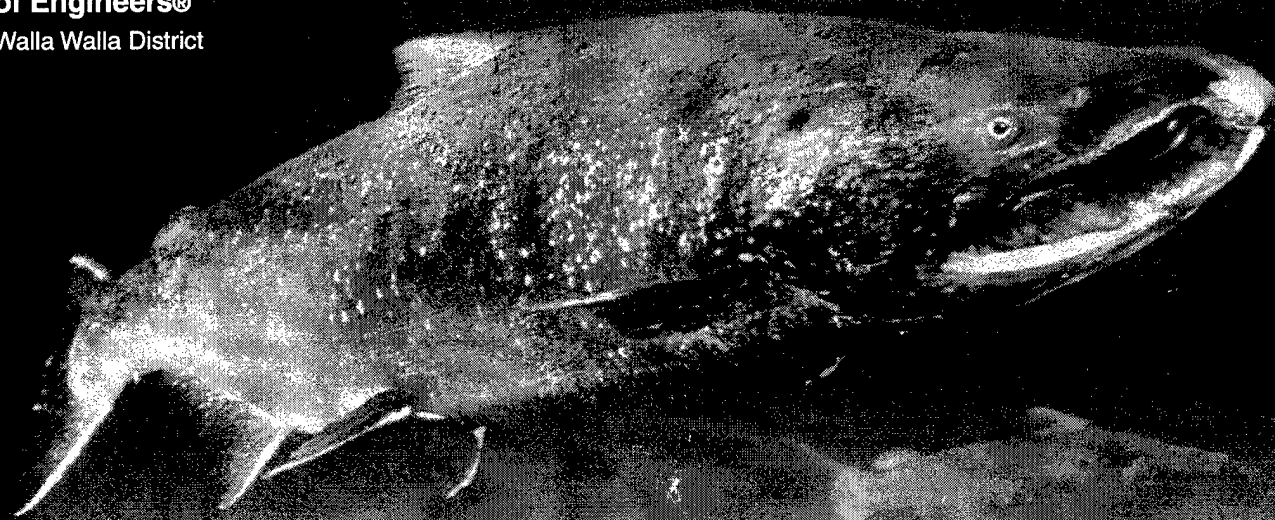




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Walla Walla District



DRAFT
Lower Snake River Juvenile
Salmon Migration Feasibility Report/
Environmental Impact Statement

APPENDIX S
Snake River Maps

20010322 011

December 1999

AGM01-05-0838

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
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4. TITLE AND SUBTITLE Lower Snake River Juvenile Salmon Migration Feasibility Report and Environmental Impact Statement (Draft FR/EIS) Appendix S Snake River Maps				5. FUNDING NUMBERS
6. AUTHOR(S) US Army Corps of Engineers, Walla Walla District				
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11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION AVAILABILITY STATEMENT Public Comment period began 17 Dec 99 and ended 30 Apr 00. Approved for public release; distribution is unlimited				12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) The Corps of Engineers along with the Bonneville Power Administration, US Environmental Protection Agency, and US Bureau of Reclamation as cooperating agencies, analyzed four general alternatives intended to provide information on the technical, environmental, and economic effects of actions related to improving juvenile salmon passage. The four alternatives include Alternative 1 - Existing Conditions (the no-action alternative) and three different ways to further improve juvenile salmon passage. The action alternatives are: Alternative 2 - Maximum Transport of Juvenile Salmon, Alternative 3 - Major System Improvements, and Alternative 4 - Dam Breaching. Comparison of the alternatives by all of the factors assessed in the study has not offered a clear-cut recommendation at this time. It is the Corps of Engineer's intent to recommend a preferred plan of action in the Final FR/EIS.				
14. SUBJECT TERMS Lower Snake River Project Endangered Species Act Fish Passage				15. NUMBER OF PAGES
				16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

FEASIBILITY STUDY DOCUMENTATION

Document Title

Summary to the Lower Snake River Juvenile Salmon Migration Feasibility
Report/Environmental Impact Statement

Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact
Statement

Appendix A	Anadromous Fish
Appendix B	Resident Fish
Appendix C	Water Quality
Appendix D	Natural River Drawdown Engineering
Appendix E	Existing Systems and Major System Improvements Engineering
Appendix F	Hydrology/Hydraulics and Sedimentation
Appendix G	Hydoregulations
Appendix H	Fluvial Geomorphology
Appendix I	Economics
Appendix J	Plan Formulation
Appendix K	Real Estate
Appendix L	Lower Snake River Mitigation History and Status
Appendix M	Fish and Wildlife Coordination Act Report
Appendix N	Cultural Resources
Appendix O	Public Outreach Program
Appendix P	Air Quality
Appendix Q	Tribal Consultation/Coordination
Appendix R	Historical Perspectives
Appendix S	Snake River Maps
Appendix T	Biological Assessment
Appendix U	Clean Water Act, Section 404(b)(1) Evaluation

The documents listed above, as well as supporting technical reports and other study information, are available on our website at www.nww.usace.army.mil. Copies of these documents are also available for public review at various city, county, and regional libraries.

FOREWORD

This appendix is one part of the overall effort of the U.S. Army Corps of Engineers (Corps) to prepare the Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement (FR/EIS).

Please note that this document is a DRAFT appendix and is subject to change and/or revision based on information received through comments, hearings, workshops, etc. After the comment period ends and hearings conclude a Final FR/EIS with Appendices is planned.

The Corps has reached out to regional stakeholders (Federal agencies, tribes, states, local governmental entities, organizations, and individuals) during the development of the FR/EIS and appendices. This effort resulted in many of these regional stakeholders providing input, comments, and even drafting work products or portions of these documents. This regional input provided the Corps with an insight and perspective not found in previous processes. A great deal of this information was subsequently included in the Draft FR/EIS and Appendices, therefore, not all the opinions and/or findings herein may reflect the official policy or position of the Corps.

STUDY OVERVIEW

Purpose and Need

Between 1991 and 1997, due to declines in abundance, the National Marine Fisheries Service (NMFS) made the following listings of Snake River salmon or steelhead under the Endangered Species Act (ESA) as amended:

- sockeye salmon (listed as endangered in 1991)
- spring/summer chinook salmon (listed as threatened in 1992)
- fall chinook salmon (listed as threatened in 1992)
- steelhead (listed as threatened in 1997)

In 1995, NMFS issued a Biological Opinion on operations of the Federal Columbia River Power System. The Biological Opinion established measures to halt and reverse the declines of these listed species. This created the need to evaluate the feasibility, design, and engineering work for these measures.

The U.S. Army Corps of Engineers (Corps) implemented a study after NMFS's Biological Opinion in 1995 of alternatives associated with lower Snake River dams and reservoirs. This study was named the Lower Snake River Juvenile Salmon Migration Feasibility Study (Feasibility Study). The specific purpose and need of the Feasibility Study is to evaluate and screen structural alternatives that may increase survival of juvenile anadromous fish through the Lower Snake River Project (which includes the four lowermost dams operated by the Corps on the Snake River—Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams) and assist in their recovery.

Development of Alternatives

The Corps completed an interim report on the Feasibility Study in December 1996. The report evaluated the feasibility of drawdown to natural river levels, spillway crest, and other improvements to existing fish passage facilities. Based in part on a screening of actions conducted in the interim report, the study now focuses on four courses of action:

- Existing conditions (currently planned fish programs)
- System improvements with maximum collection and transport of juveniles (without major system improvements such as surface bypass collectors)
- System improvements with maximum collection and transport of juveniles (with major system improvements such as surface bypass collectors)
- Dam breaching or permanent drawdown to natural river levels for all reservoirs

The results of these evaluations are presented in the combined Feasibility Report (FR) and Environmental Impact Statement (EIS). The FR/EIS provides the support for recommendations that will be made regarding decisions on future actions on the Lower Snake River Project for passage of juvenile salmonids. This appendix is a part of the FR/EIS.

Geographic Scope

The geographic area covered by the FR/EIS generally encompasses the 140-mile long lower Snake River reach between Lewiston, Idaho and the Tri-Cities in Washington. The study area does slightly vary by resource area in the FR/EIS because the affected resources have widely varying spatial characteristics throughout the lower Snake River system. For example, socioeconomic effects of a permanent drawdown could be felt throughout the whole Columbia River Basin region with the most effects taking place in the counties of southwest Washington. In contrast, effects on vegetation along the reservoirs would be confined to much smaller areas.

Identification of Alternatives

Since 1995, numerous alternatives have been identified and evaluated. Over time, the alternatives have been assigned numbers and letters that serve as unique identifiers. However, different study groups have sometimes used slightly different numbering or lettering schemes and this has lead to some confusion when viewing all the work products prepared during this long period. The primary alternatives that are carried forward in the FR/EIS currently involve four major alternatives that were derived out of three major pathways. The four alternatives are:

Alternative Name	PATH ^{1/} Number	Corps Number	FR/EIS Number
Existing Conditions	A-1	A-1	1
Maximum Transport of Juvenile Salmon	A-2	A-2a	2
Major System Improvements	A-2'	A-2c	3
Dam Breaching	A-3	A-3a	4

^{1/} Plan for Analyzing and Testing Hypotheses

Summary of Alternatives

The **Existing Conditions Alternative** consists of continuing the fish passage facilities and project operations that were in place or under development at the time this Feasibility Study was initiated. The existing programs and plans underway would continue. Project operations, including all ancillary facilities such as fish hatcheries and Habitat Management Units (HMUs) under the Lower Snake River Fish and Wildlife Compensation Plan (Comp Plan), recreation facilities, power generation, navigation, and irrigation would remain the same unless modified through future actions. Adult and juvenile fish passage facilities would continue to operate.

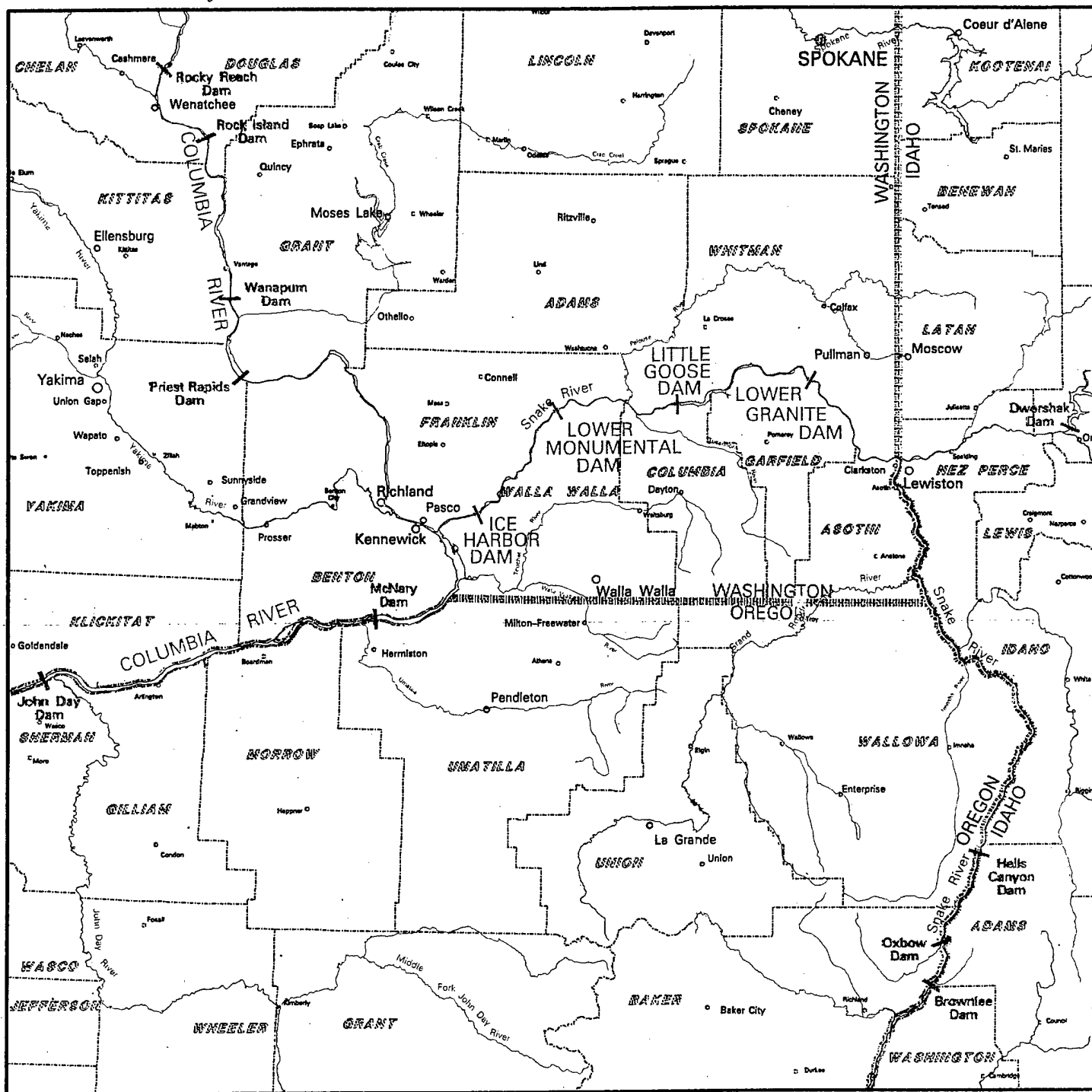
The **Maximum Transport of Juvenile Salmon Alternative** would include all of the existing or planned structural and operational configurations from the Existing Conditions Alternative. However, this alternative assumes that the juvenile fishway systems would be operated to maximize fish transport from Lower Granite, Little Goose, and Lower Monumental and that voluntary spill would not be used to bypass fish through the spillways (except at Ice Harbor). To accommodate this maximization of transport some measures would be taken to upgrade and improve fish handling facilities.

The **Major System Improvements Alternative** would provide additional improvements to what is considered under the Existing Conditions Alternative. These improvements would be focused on using surface bypass collection (SBC) facilities in conjunction with extended submersible bar screens (ESBS) and a behavioral guidance system (BGS). The intent of these facilities is to provide more effective diversion of juvenile fish away from the turbines. Under this alternative the number of fish collected and delivered to upgraded transportation facilities would be maximized at Lower Granite, the most upstream dam, where up to 90 percent of the fish would be collected and transported.

The **Dam Breaching Alternative** has been referred to as the "Drawdown Alternative" in many of the study groups since late 1996 and the resulting FR/EIS reports. These two terms essentially refer to the same set of actions. Because the term drawdown can refer to many types of drawdown, the term dam breaching was created to describe the action behind the alternative. The Dam Breaching Alternative would involve significant structural modifications at the four lower Snake River dams allowing the reservoirs to be drained and resulting in a free-flowing river that would remain unimpounded. Dam breaching would involve removing the earthen embankment sections of the four dams and then developing a channel around the powerhouses, spillways, and navigation locks. With dam breaching, the navigation locks would no longer be operational, and navigation for large commercial vessels would be eliminated. Some recreation facilities would close while others would be modified and new facilities could be built in the future. The operation and maintenance of fish hatcheries and Habitat Management Units (HMUs) would also change although the extent of change would probably be small and is not known at this time. Project development, design, and construction span a period of nine years. The first three to four years concentrate on the engineering and design processes. The embankments of the four dams are breached during two construction seasons at year 4-5 in the process. Construction work dealing with mitigation and restoration of various facilities adjacent to the reservoirs follows dam breaching for three to four years.

Authority

The four Corps dams of the lower Snake River were constructed and are operated and maintained under laws that may be grouped into three categories: 1) laws initially authorizing construction of the project, 2) laws specific to the project passed subsequent to construction, and 3) laws that generally apply to all Corps reservoirs.

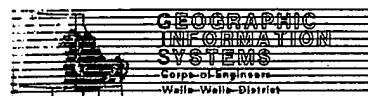
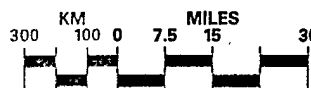
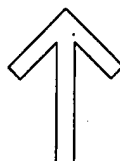


BOUNDARIES

State



County



125,000
ACRES



1 : 1,900,800

DRAFT

Lower Snake River
Juvenile Salmon Migration Feasibility Study

**REGIONAL
BASE MAP**

ABSTRACT

This is Appendix S—Snake River Maps to the Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement. This appendix was prepared by the U.S. Army Corps of Engineers Walla Walla District. This appendix is intended to share maps and aerial photo displays of the Lower Snake River Project (LSRP). These presentations give the reader insight into the LSRP prior to dam construction (before 1961) and after dam construction (after 1975).



**US Army Corps
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Walla Walla District

Draft

**Lower Snake River Juvenile Salmon
Migration Feasibility Report/
Environmental Impact Statement**

**Appendix S
Snake River Maps**

**Produced by
U.S. Army Corps of Engineers
Walla Walla District**

Completed November 1999
Revised and released for review
with Draft FR/EIS
December 1999

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1.	Introduction	S1-1
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2.1	1934 Survey Drawings	S2-1
2.2	Aerial Photography	S2-2
3.	Map Presentations	S3-1
3.1	Survey Drawing Displays	S3-1
3.2	Pre- and Post-Dam Comparison Displays	S3-1
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Annex B	Pre- and Post-Dam Comparison Displays	

TABLES

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ACRONYMS AND ABBREVIATIONS

3-D	three dimensional
dpi	dots per inch
GIS	geographic information system
LSRP	Lower Snake River Project
msl	mean sea level
RM	River Mile
USE	U.S. Engineer

1. Introduction

This appendix is intended to share maps and aerial photo displays of the Lower Snake River Project (LSRP). These presentations give the reader insight into the LSRP prior to dam construction (before 1961) and after dam construction (after 1975).

2. Mapping Products

2.1 1934 Survey Drawings

Documented surveys with depth-soundings on the LSRP were first conducted in the late 1800s. Only two depth-sounding surveys cover the entire LSRP and these were completed in 1917 and 1934. The 1934 survey was chosen for this appendix because it contains much more detail. Since 1934, depth-sounding surveys were conducted only on selected areas within the LSRP. The figures in this appendix are from the original linen drawings.

2.1.1 Type of Data

The survey drawings are a collection of 155 sheets covering 176 river miles, beginning at the mouth of the Snake River (River Mile 0.0) and were originally drawn at the scale of 1:2,000.

The 1934 drawings include the following information:

- topographic contours (5 foot)
- shoreline
- ground descriptions (grass, sand, cultivated)
- sounding depths
- depth contours (6 and 9 foot)
- proposed navigation channel centerline
- northing/easting and longitude/latitude tick marks
- U.S. Engineer (U.S.E.) bench marks
- river miles (not the same as reservoir river miles)
- roads and railroads
- substrate information
- islands
- low water elevation marks
- buildings
- rapids (average & maximum velocity)
- spot elevations
- monument stations

2.1.2 Original Purpose

The drawings are taken from a larger report entitled *Review Report, Snake River, Washington-Idaho, Mouth to Oregon-Washington Line*, dated June 10, 1935, by the U.S. Engineer Office, Portland, Oregon. Sounding data was taken to determine a proposed navigation channel, document the topography, and site locations of rapids.

2.1.3 Survey Components

The method of survey is not known because the associated report or other documentation was not found with the drawings. The original maps were prepared on linen media. Notes on the drawings identify the following creation specifics:

- Elevations are referred to as mean sea level (msl) (U.S.C & G.S. Datum 1929 adjustment).
- Soundings are in feet and tenths and show depths at adopted low water plane (based on 0.0 at U.S. Weather Bureau gage at Riparia, El 512.05 msl).
- Figures in parentheses indicate height in feet above low water (for example, 1.7).
- Contour interval is 5 feet.
- Distance in miles from mouth of river is measured on the centerline of the proposed channel.

2.1.4 Electronic Conversions and Processing

In 1998 the Walla Walla District converted the 1934 drawings to 3-D geographic information system (GIS) files. At the same time the approximately 126,000 sounding points (depth of river) were also converted into 3-D GIS files with horizontal and vertical values. The drawings were scanned at 200 dots per inch (dpi). Longitude and latitude tick mark information was taken from the drawings, inputted into files, and labeled. During data verification of the longitude and latitude tick mark locations, the tick marks were found not to match current coordinate systems, so drawings do not correctly overlay current topographic data. Images were geographically referenced into position using the longitude and latitude locations from the drawings. The raster line work was then converted into 3-D vector data with each reservoir reach as the upper and lower boundary for that section of the river.

2.2 Aerial Photography

2.2.1 1956 to 1962

Aerial photography flown between 1956 and 1962 was stereoplotted to develop topographic mapping. The topographic mapping was used to geographically reference the 1958 aerial photography that represents the pre-project condition for the LSRP. See Table 2.1 for aerial flight details.

2.2.2 1958, 1991, and 1992

Aerial photography was flown in 1958, 1991, and 1992 for the purpose of recording what the river looked like during that time period. The 1958 aerial flight documents the appearance of the lower Snake River prior to dam construction. The 1991 and 1992 flights provide information used in managing recreation areas and wildlife habitat units within the boundaries of the LSRP. See Table 2.1 for aerial flight details.

Table 2-1. Aerial Flight Information

Description	Roll Number	Date Flown	Scale	% Overlap	Control
1956 Snake River					
Snake River Mouth to Riparia	W56-52V	14 Sep	1:20,700	60	Yes
1957 Snake River					
Lake Herbert G. West	W57-70V	10 Sep	1:9,600	60	Yes
Lake Herbert G. West	W57-71V	12 Oct	1:9,600	60	Yes
1958 Snake River					
Low Water — RM 10 to Johnson Bar	W58-74V	28 Aug	1:10,000	Minimum	No
Low Water — RM 10 to Johnson Bar	W58-75V	28 Aug	1:10,000	Minimum	No
1959 Snake River					
Lake Bryan	W59-93V	2 Nov	1:9,600	60	Yes
Lake Bryan	W59-94V	6 Nov	1:9,600	60	Yes
Lake Bryan	W59-95V	14 Nov	1:20,000	60	Yes
Lake Bryan	W59-95V	30 Nov	1:20,000	60	Yes
1960 Snake River					
Lower Granite Lake—Low Altitude	W60-8	1 Dec	1:9,600	60	Yes
Lower Granite Lake—Low Altitude	W60-9	13 Dec	1:9,600	60	Yes
1991 Snake River					
RM 0.0 to Lower Monumental Dam	W91-03	30 Aug	1:24,000	60	Yes
1992 Snake River					
Lower Monumental Dam to Asotin	W92-12	19 Apr	1:24,000	60	Yes

3. Map Presentations

3.1 Survey Drawing Displays

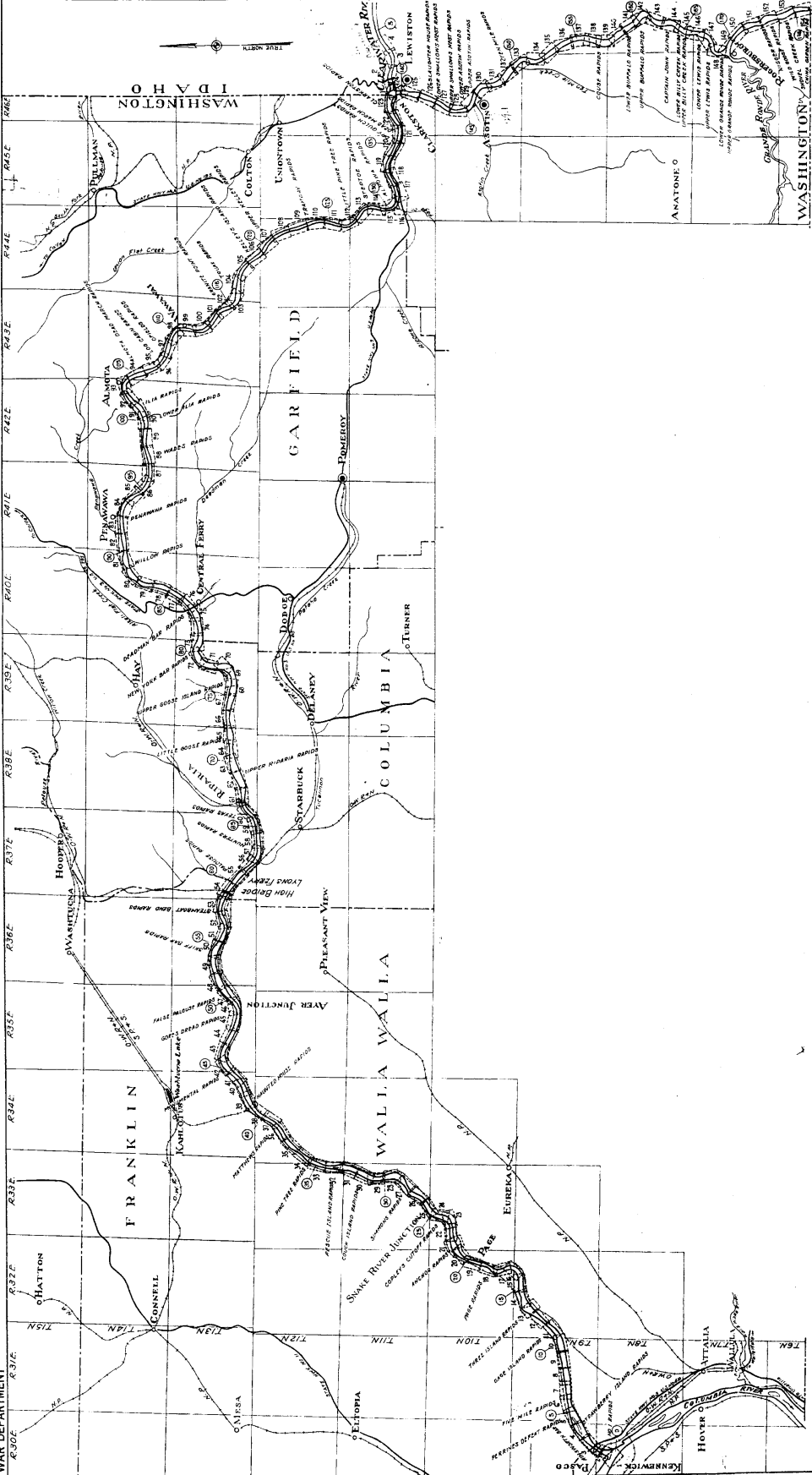
The 1934 mapping found in Annex A is a subset of the entire mapping collection. Only 131 sheets were selected to represent the LSRP, starting at the mouth of the Snake River to a point above Asotin, WA. An index map in the front of the collection helps the reader select sheets of interest.

3.2 Pre- and Post-Dam Comparison Displays

A total of 21 pre- and post-dam comparison displays have been compiled and are found in Annex B. Each display is of a particular geographic location on the lower Snake River. Aerial photography from 1958, 1991, and 1992 are compared showing pre- and post-dam shorelines along with post-dam shoreline superimposed on the 1958 photo. In addition, up to three oblique photos, taken between 1958 and 1960, are presented with a relationship to the 1958 aerial photo. For those locations where fewer than 3 photos are available, there is a blank area on the sheet. There are 6 displays from the river and reservoir between Ice Harbor and Lower Monumental Dams, 7 displays between Lower Monumental and Little Goose Dams, 8 displays between Little Goose and Lower Granite Dams, and one display from Lower Granite Dam to Clarkston.

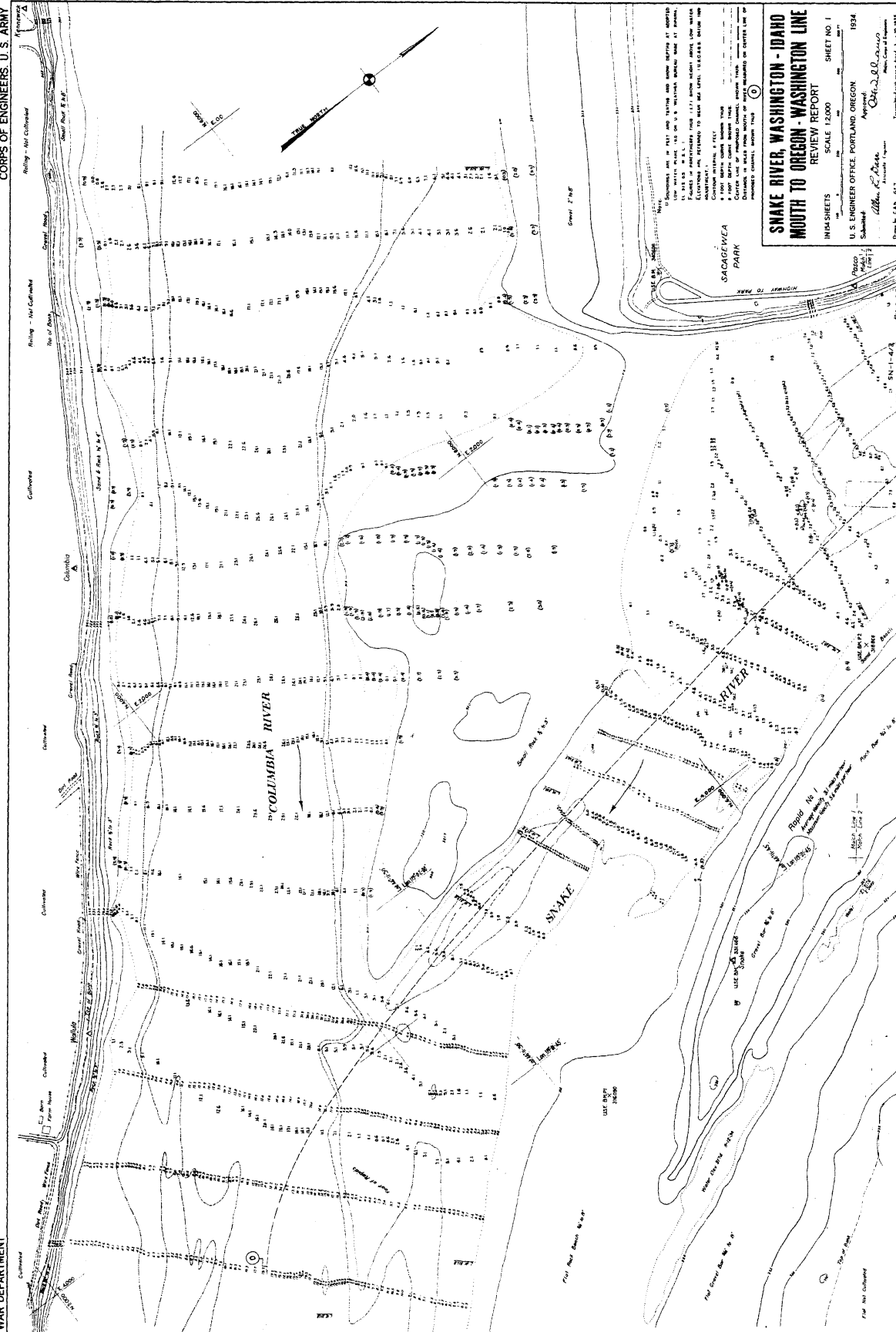
Annex A

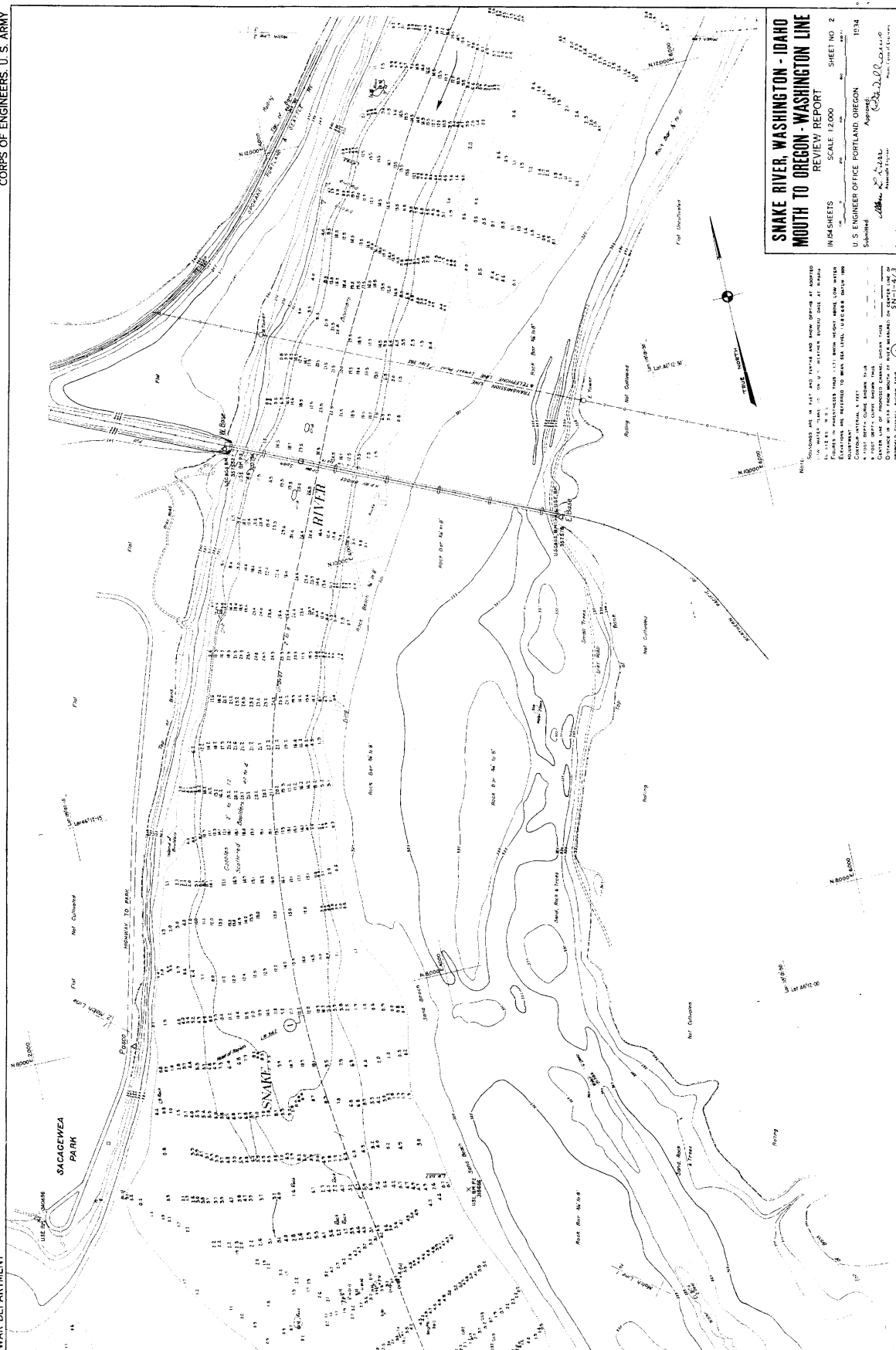
**1934 SURVEY DRAWINGS:
SHEET NUMBERS 1 THROUGH 131 AND OVERVIEW SHEET**



WASHINGTON - IDAHO
WASHINGTON - OREGON
SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
INDEX MAP

U. S. ENGINEER OFFICE PORTLAND, OREGON
1934
Submitted by: [Signature]
Approved: [Signature]
Checked: [Signature]
Transmitted with report dated June 10, 1934.
Drawn by: [Signature]
SN-1-1270





**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

N 154 SHEETS
 SCALE 1:2 000
 REVIEW REPORT
 SHEET NO. 2

WAVELENGTH	250	400	600
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U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1034

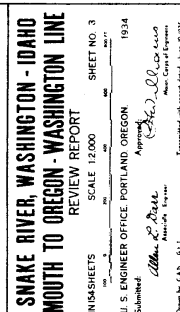
Submitted: _____ Approved: _____

Alan Linn

Associate Engineer
Mason, George J. 1870-1900

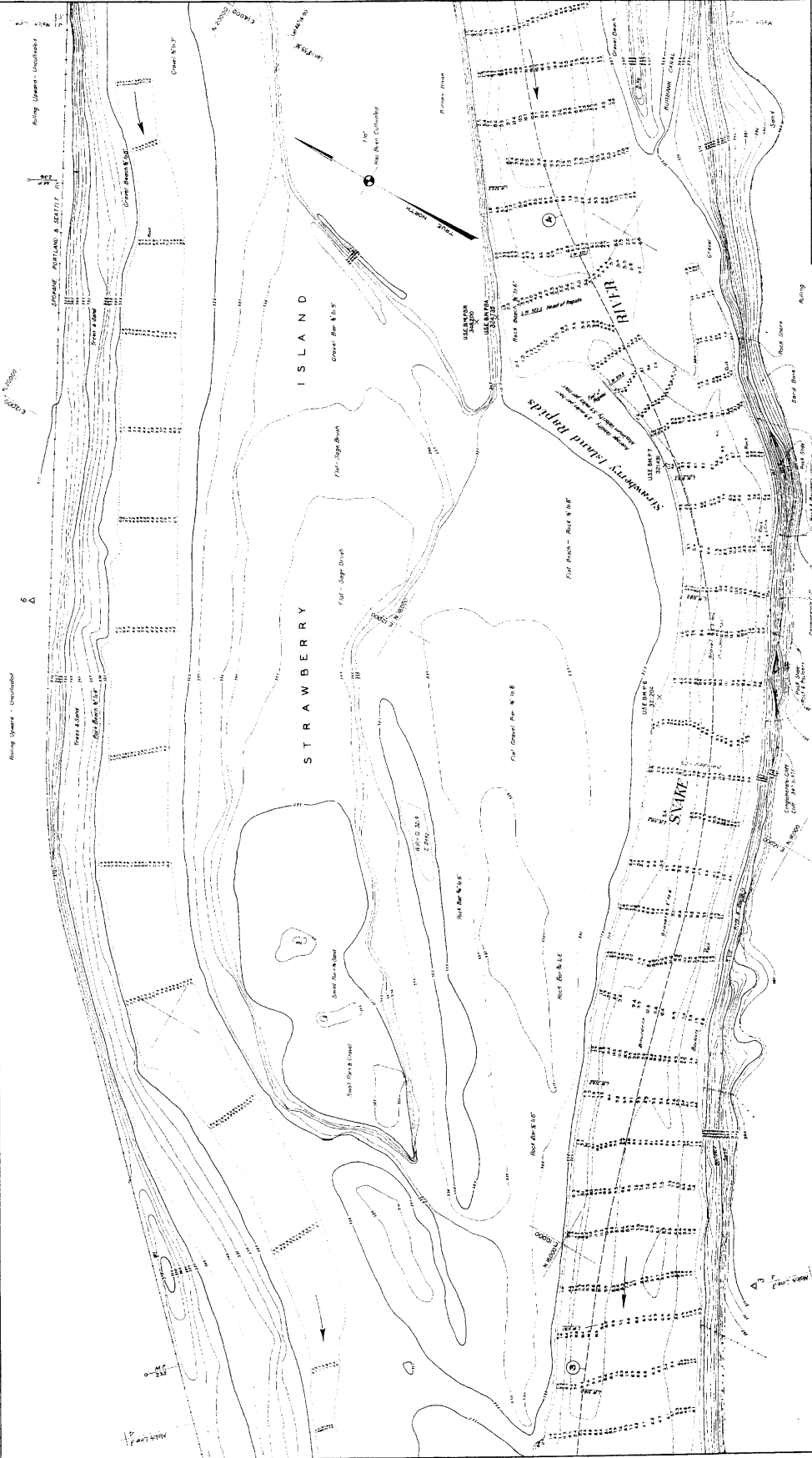
Reviewed by C A D G E T.
 Transcribed with report dated June 30 1935

SN-1-12/2

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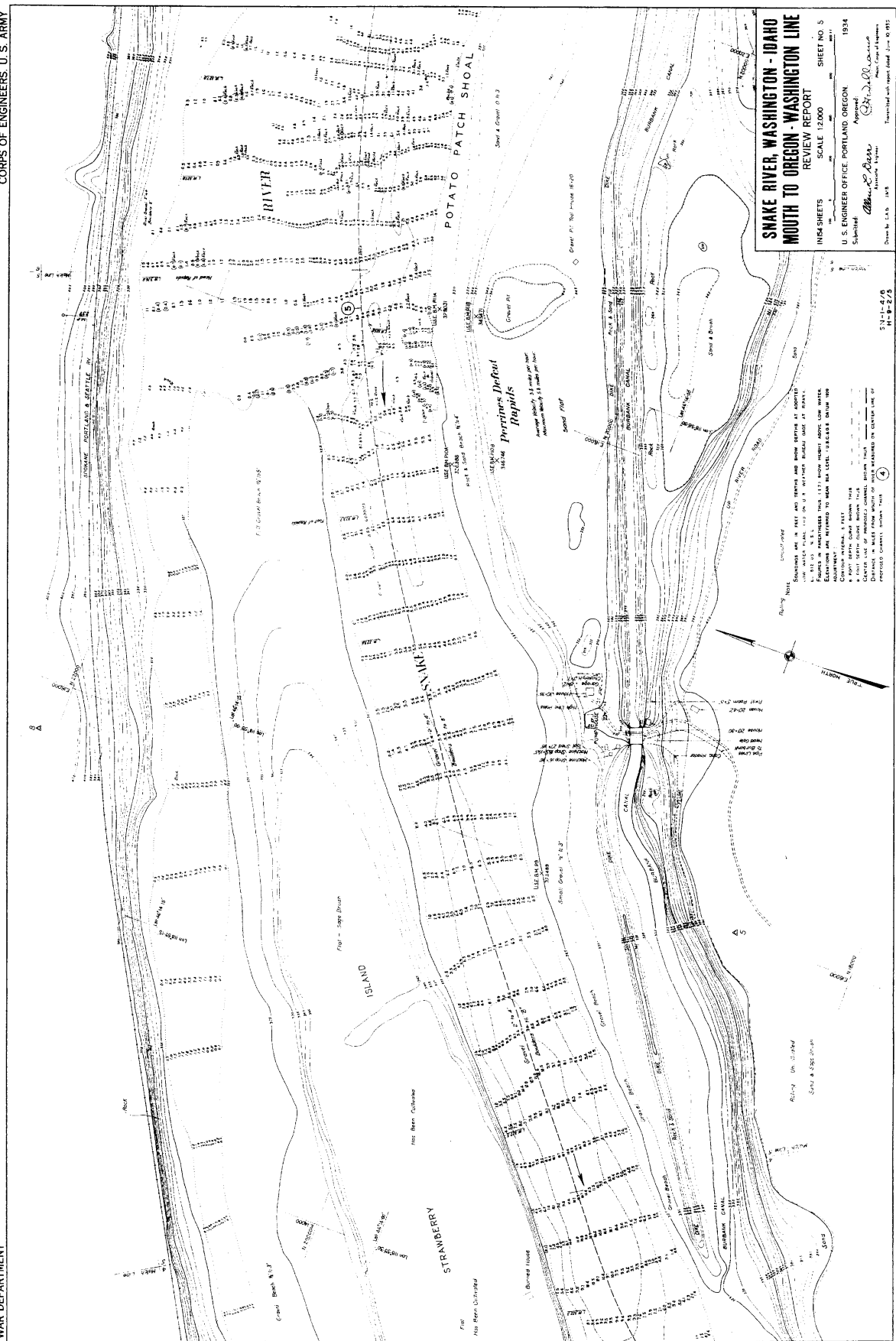
Submitted: *Allen L. Dine* Assistant Engineer
Approved: *W. L. L. L. L. L.* Chief of Engineers
J. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

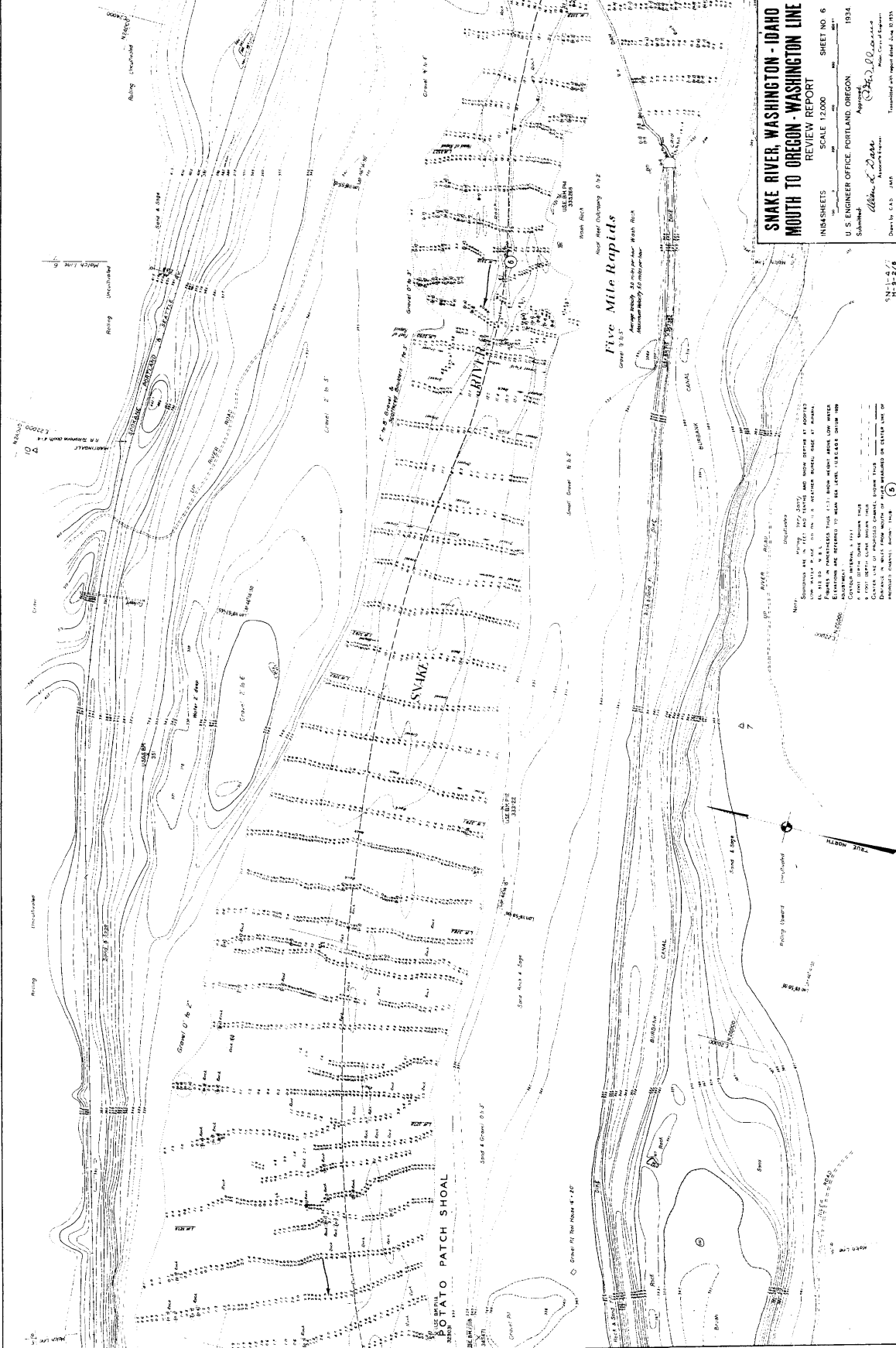
SN-1-1273



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**
REVIEW REPORT
IN 54 SHEETS SCALE 12,000 SHEET NO. 4
U. S. ENGINEER OFFICE PORTLAND, OREGON
Submitted: *Wm. C. Allen* Approved: *Wm. C. Allen*
1934
Drawn by: *Wm. C. Allen* Checked by: *Wm. C. Allen*
SN-1-1274

Notes:
1. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
2. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
3. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
4. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
5. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
6. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
7. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
8. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
9. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.
10. Elevation of water surface at high water and low water as adopted from U. S. Army Corps of Engineers, Portland, Oregon, 1934.



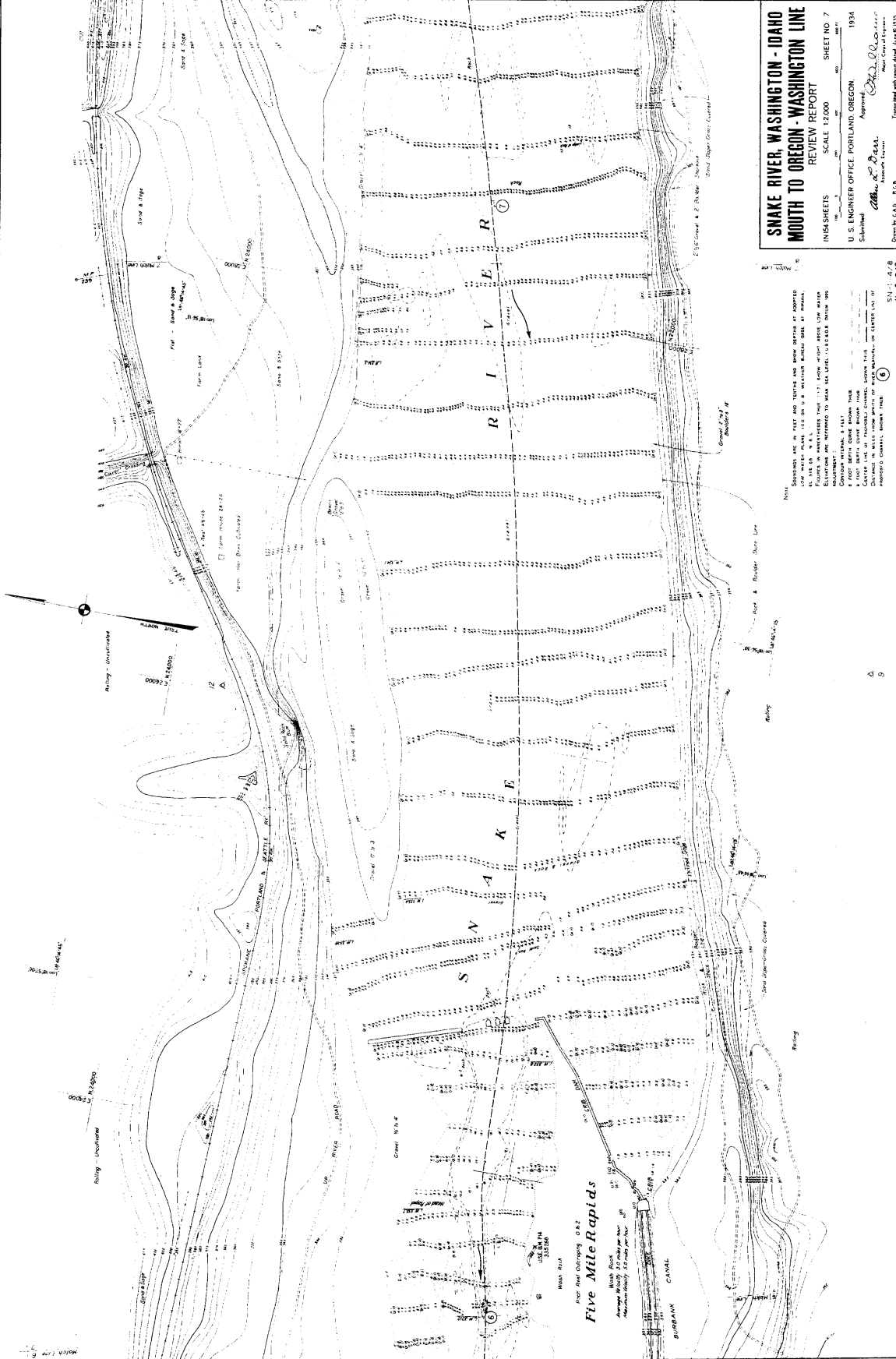


Snake River, Washington - Idaho
MOUTH TO OREGON - WASHINGTON LINE
REVIEW REPORT

INDASHEETS SCALE 12,000 SHEET NO. 6
 U. S. ENGINEER OFFICE, PORTLAND, OREGON, 1934
 Submitted *Wm. L. Dake* Approved *Wm. L. Dake*
 Checked by C. A. D. 1047

SN-1-12/6

SN-1-4/1
 SN-1-5/2/6



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

REVIEW REPORT

INS. SHEETS SCALE 1:20,000 SHEET NO. 7

U. S. ENGINEER OFFICE PORTLAND, OREGON

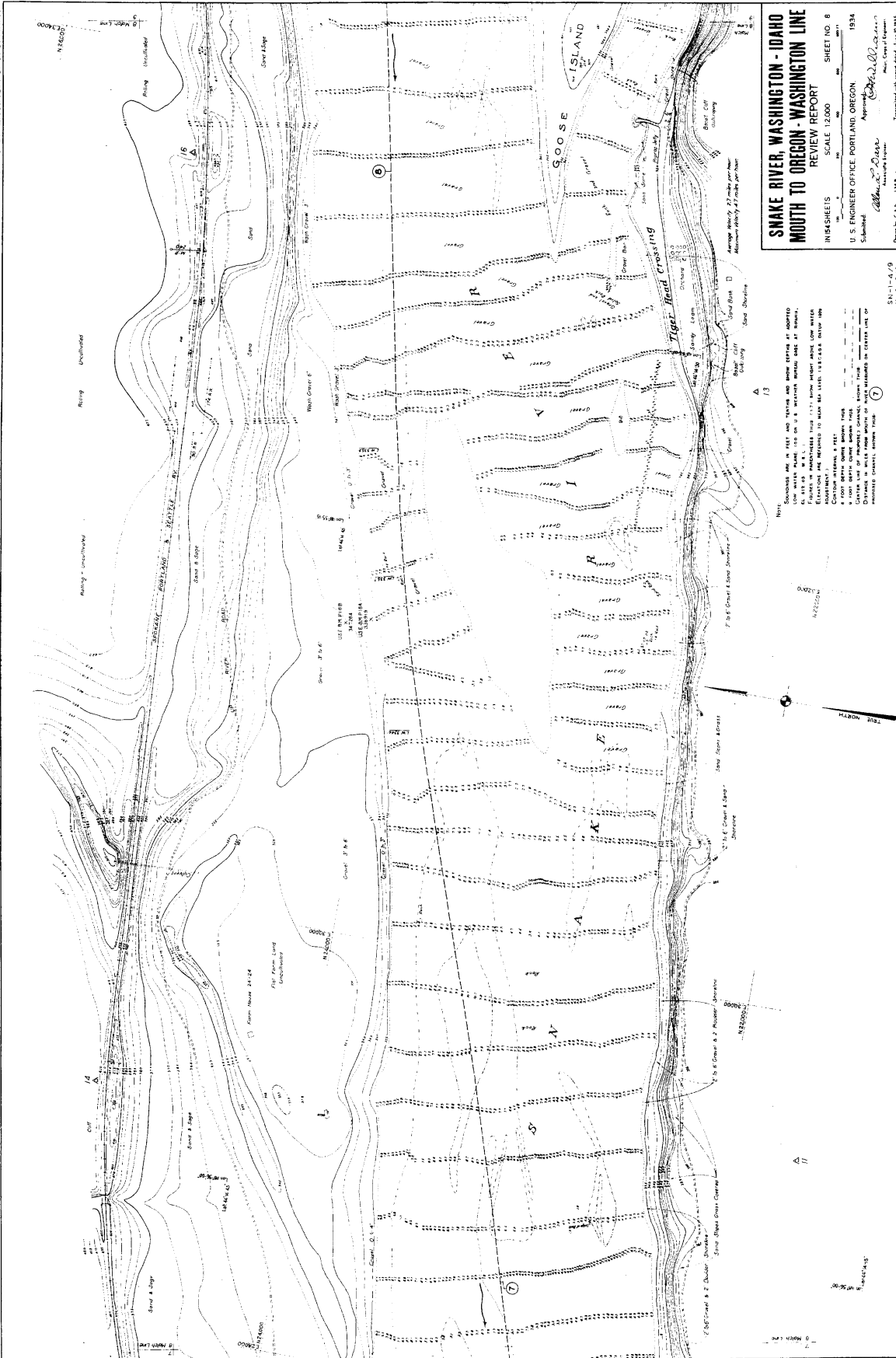
Submitted *[Signature]* Approved *[Signature]* 1934

Checked by C. A. B. R. C. B.

Transmitted with report dated June 1934

SN-1277

NOTES:
1. Soundings are in feet and tenths and some depths at right angles to the river channel are in feet and tenths. All soundings are in feet and tenths.
2. All elevations are in feet above mean low water.
3. Elevation of bench mark is 117.75 feet above mean low water.
4. Elevation of river bed is 117.75 feet above mean low water.
5. Elevation of river bank is 117.75 feet above mean low water.
6. Elevation of river channel is 117.75 feet above mean low water.
7. Elevation of river bottom is 117.75 feet above mean low water.
8. Elevation of river surface is 117.75 feet above mean low water.
9. Elevation of river bottom is 117.75 feet above mean low water.
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18. Elevation of river surface is 117.75 feet above mean low water.
19. Elevation of river bottom is 117.75 feet above mean low water.
20. Elevation of river surface is 117.75 feet above mean low water.

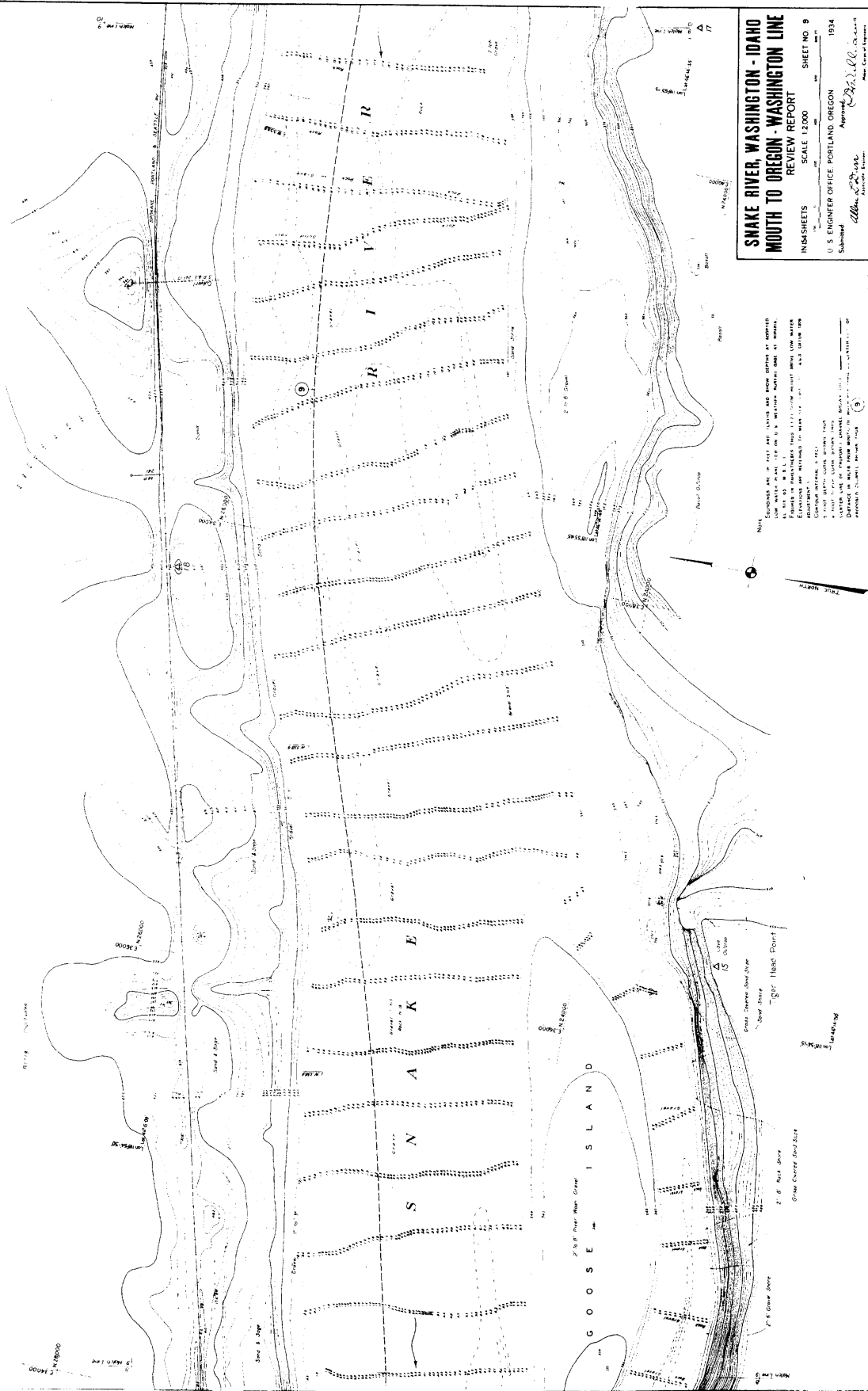


**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**
REVIEW REPORT

IN 54 SHEETS SCALE 1:25,000 SHEET NO. 8

U. S. ENGINEER OFFICE PORTLAND, OREGON
Submitted by *John J. Blaine*
Approved by *John J. Blaine*
Checked by *John J. Blaine*
Drawn by *C. A. B.* 2 M.B.
Transmitted with report dated June 10, 1915
SN-1-12/8

Notes:
1. Soundings are in feet and tenths and some are in feet and tenths and hundredths.
2. Low water plane 100 ft. or more below mean high water.
3. Elevation in parentheses is feet above mean high water.
4. Elevation in parentheses is feet below mean high water.
5. Elevation in parentheses is feet above or below mean high water.
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**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
REVIEW REPORT**

IN 154 SHEETS SCALE 1:2,000 SHEET NO. 9

IN 154 SHEETS

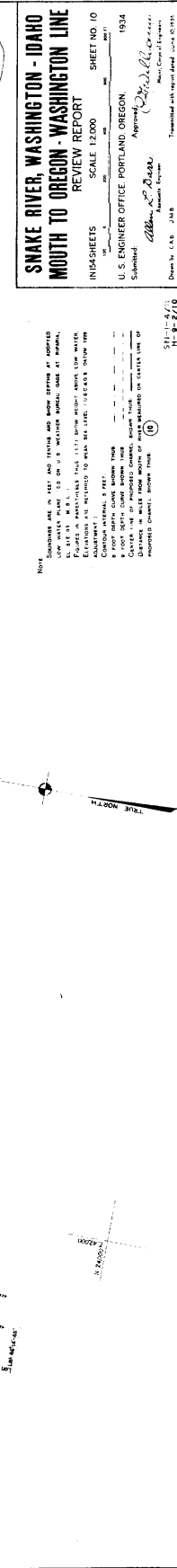
U S ENGINEER OFFICE, PORTLAND, OREGON 1934

Submitted: 11/28/00 Approved: 12/1/00

Allen & D'Amico
Associate Engineers
Major, Corps of Engineers
1712 E. 11th St., Kansas City, Mo.

Approved by C. A. : R.C.B.
Transmitted with report dated June 10, 1945
SN-1-1219

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**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

UN 154 SHEETS SCALE 1:2,000 SHEET NO. 10

IN 154 SHEETS SCALE 1:2,000 SHEET NO. 10

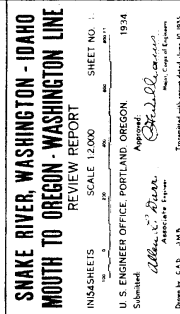
U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Submitted: _____ Approved: _____
U. S. ENGINEER OFFICE, PORTLAND, OREGON, 1934

Allen L. Barr
(L. D. Hill, Jr.)

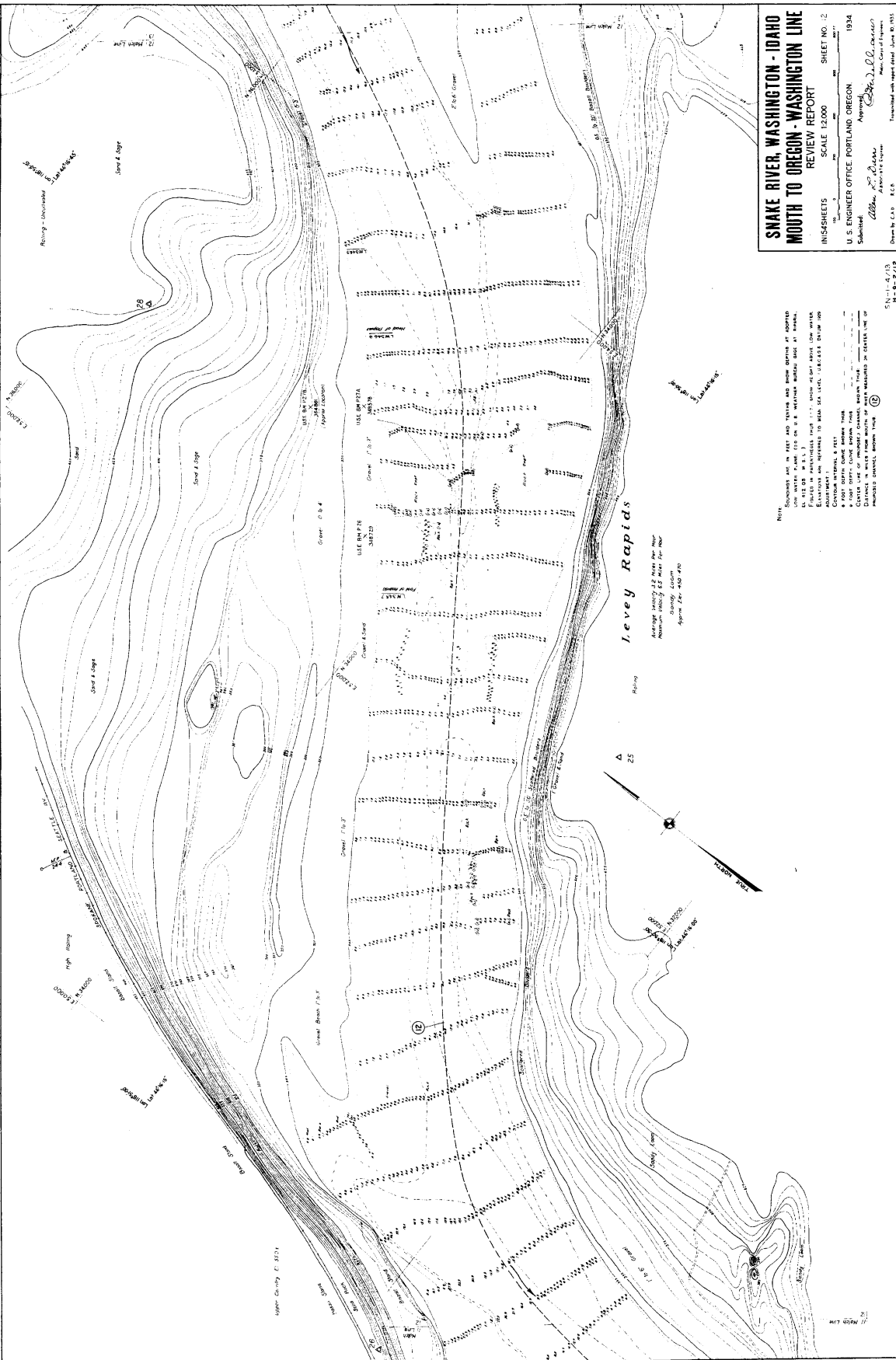
Drawn by C. A. D. JMB
 Associate Engineer
 Major, Corps of Engineers
 Transmitted with report dated June 10, 1935

SN-1-12/10

[illegible]

SN-1-4/12

Major, Corps of Engineers
Transmitted with report dated June 10 1955
SN-1-12/11



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

INISARCHETS SCALE 1:2,000 SWEET NO. 12

U.S. ENGINEER OFFICE PORTLAND OREGON

SCALE 1"=100'

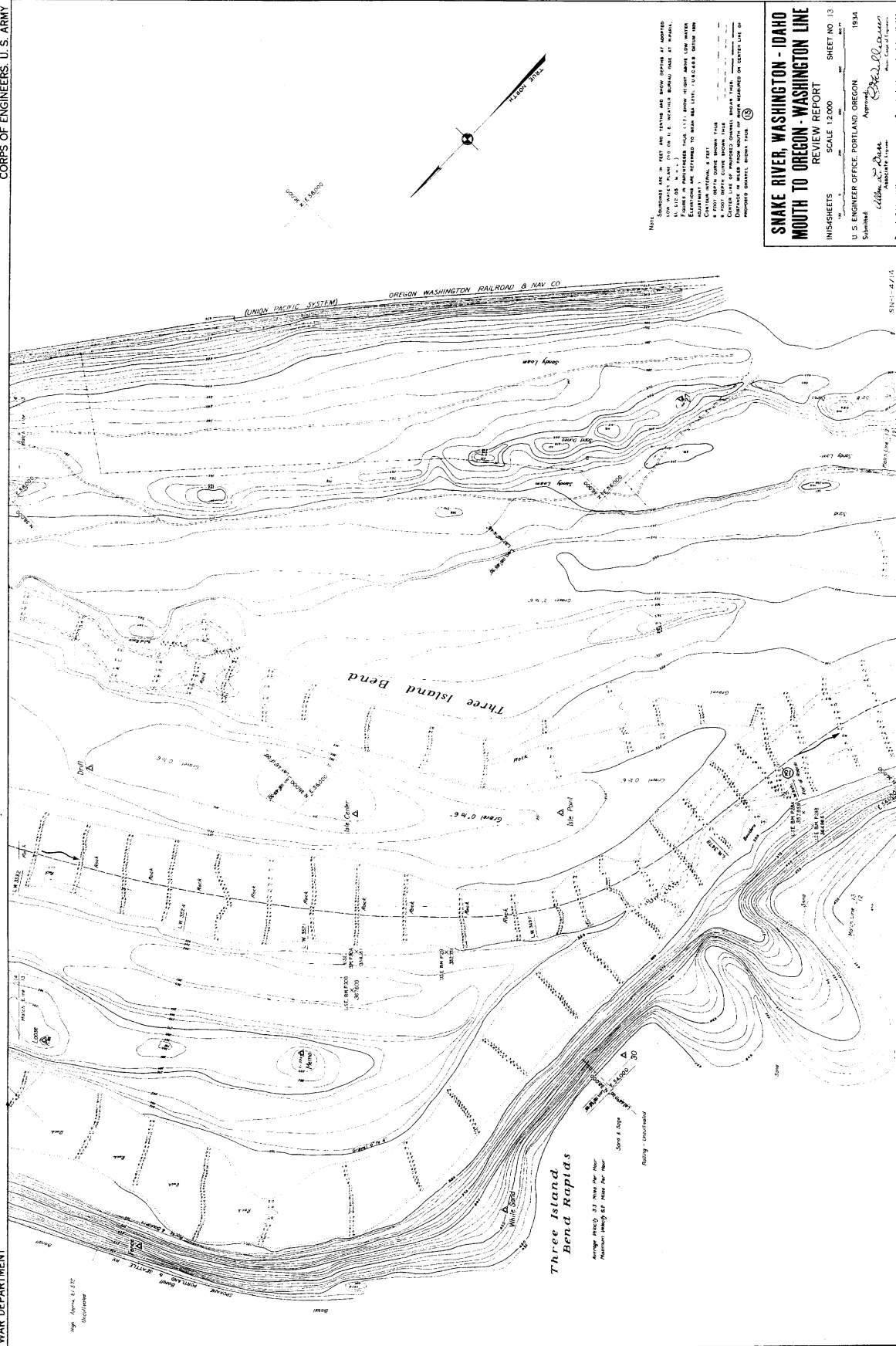
SHEET NO. 12

1934

Submitted: *Allen, T. Davis* Approved: *Edith L. L. Jones*

Desig by C.A.D. R.C.B. Aeronautic Engineer
 Mater. Corps of Engineers
 Transmitted with report dated June 10, 1935

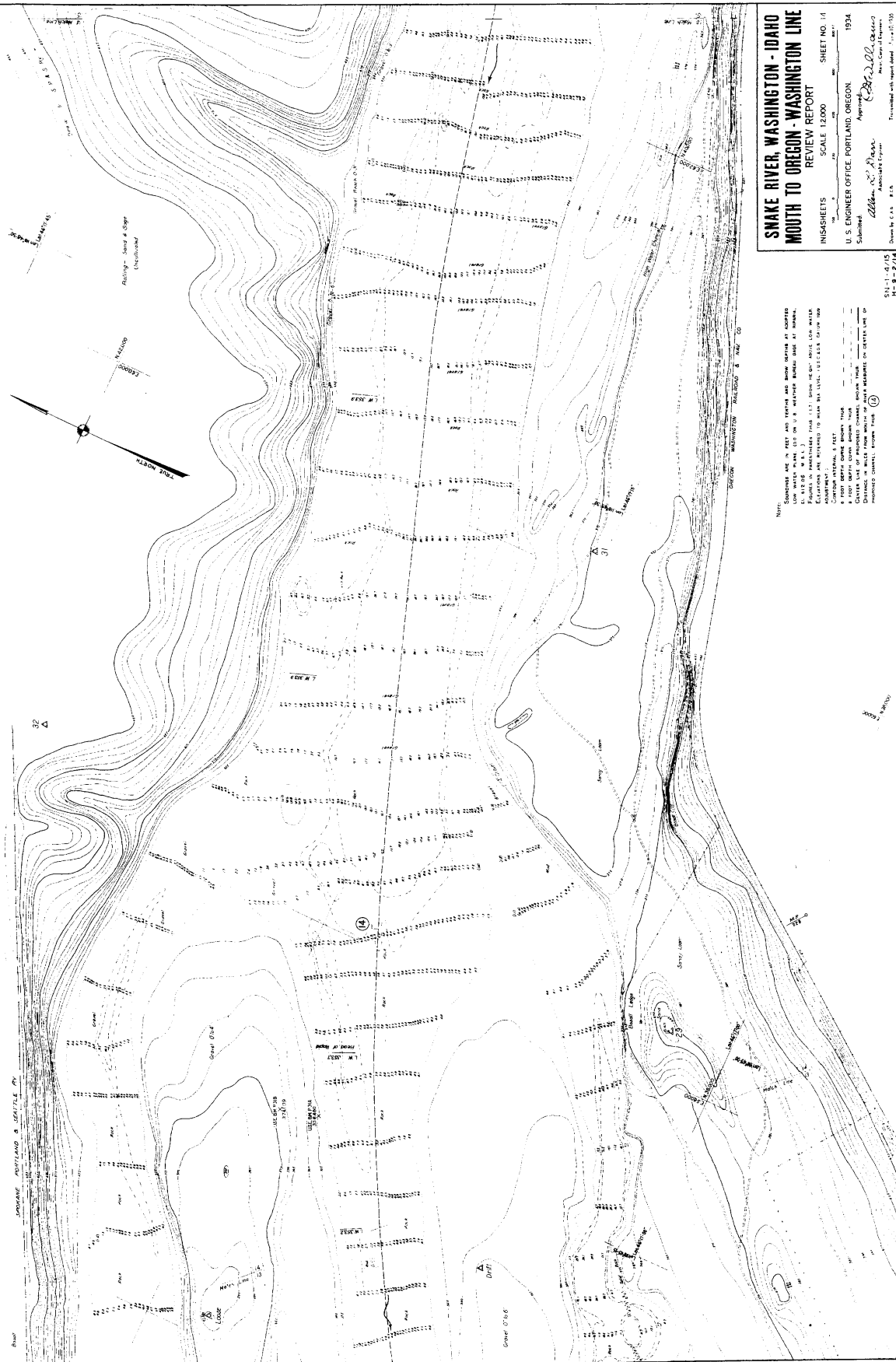
SN-1-12/12

[illegible]

**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

REVIEW REPORT
 SHEET NO. 13
 SCALE 1:2,000
 U. S. ENGINEER OFFICE, PORTLAND, OREGON
 1934
 Submitted: *Wm. A. Dine*
 Approved: *W. H. Dillman*
 Wm. A. Dine
 W. H. Dillman
 Major Civil Engineer
 Major Civil Engineer

Drawn by C.A.D. JMB
Transmitted with report dated June 10, 1955
SN-1213



SNAKE RIVER, WASHINGTON - IDAHO
 MOUTH TO OREGON - WASHINGTON LINE

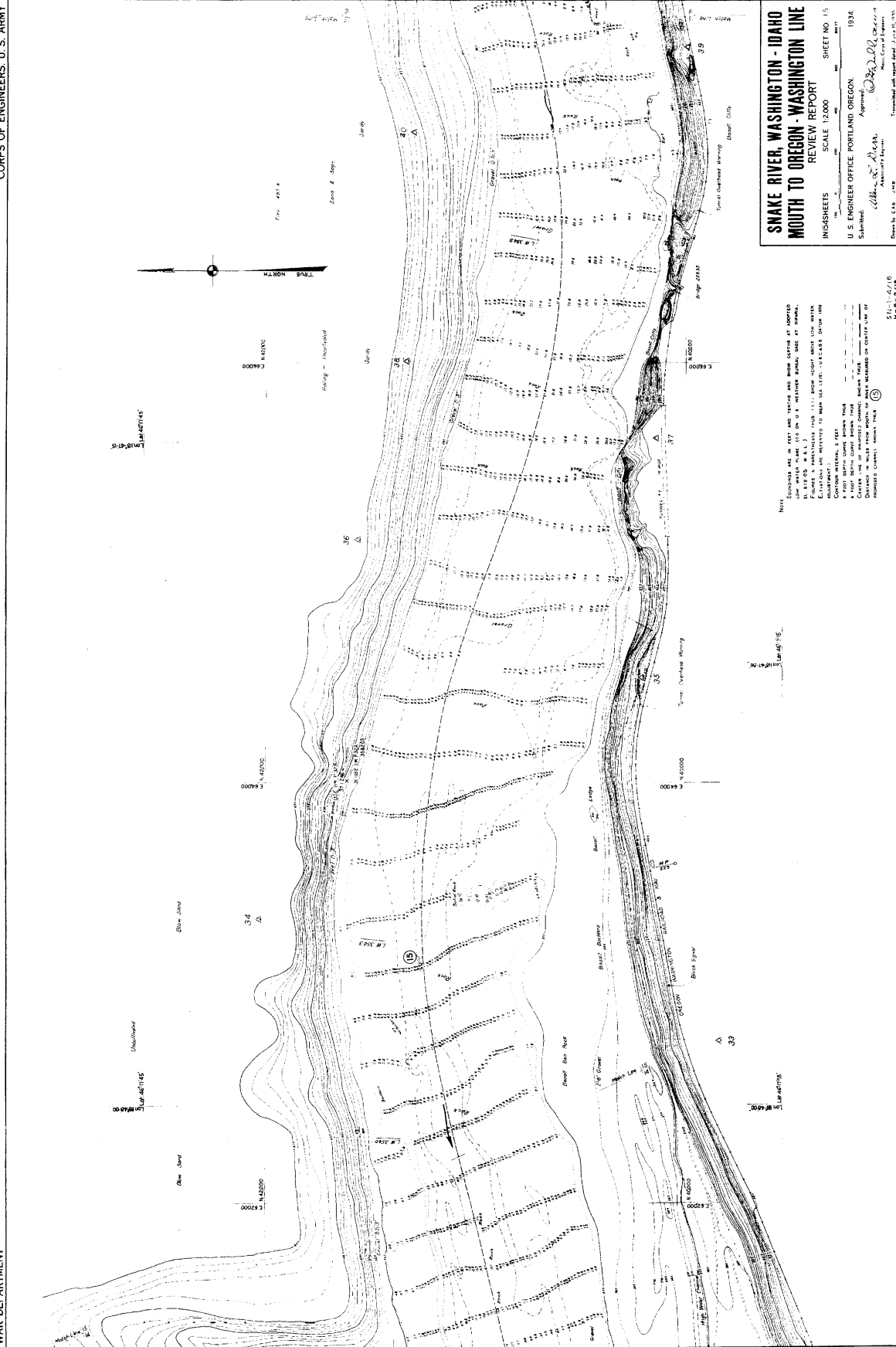
UNISAS SHEETS SCALE 12,000 SHEET NO. 14

SHEET NO. 14
 SCALE 1:2000
 U.S. ENGINEER OFFICE PORTLAND, OREGON
 1934

Submitted: *Allen E. Dam*
Approved: *C. H. DeLoraine*
U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934.

Drawn by C. A. D. R. C. B.
Associate Engineer
Mass. Corps of Engineers
Transmitted with report dated June 10, 1935

SN-1-12/14



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

INCHES SHEETS SCALE 1:20,000 SHEET NO. 15 OF 16

U. S. ENGINEER OFFICE PORTLAND, OREGON 1934.

Submitted Approved

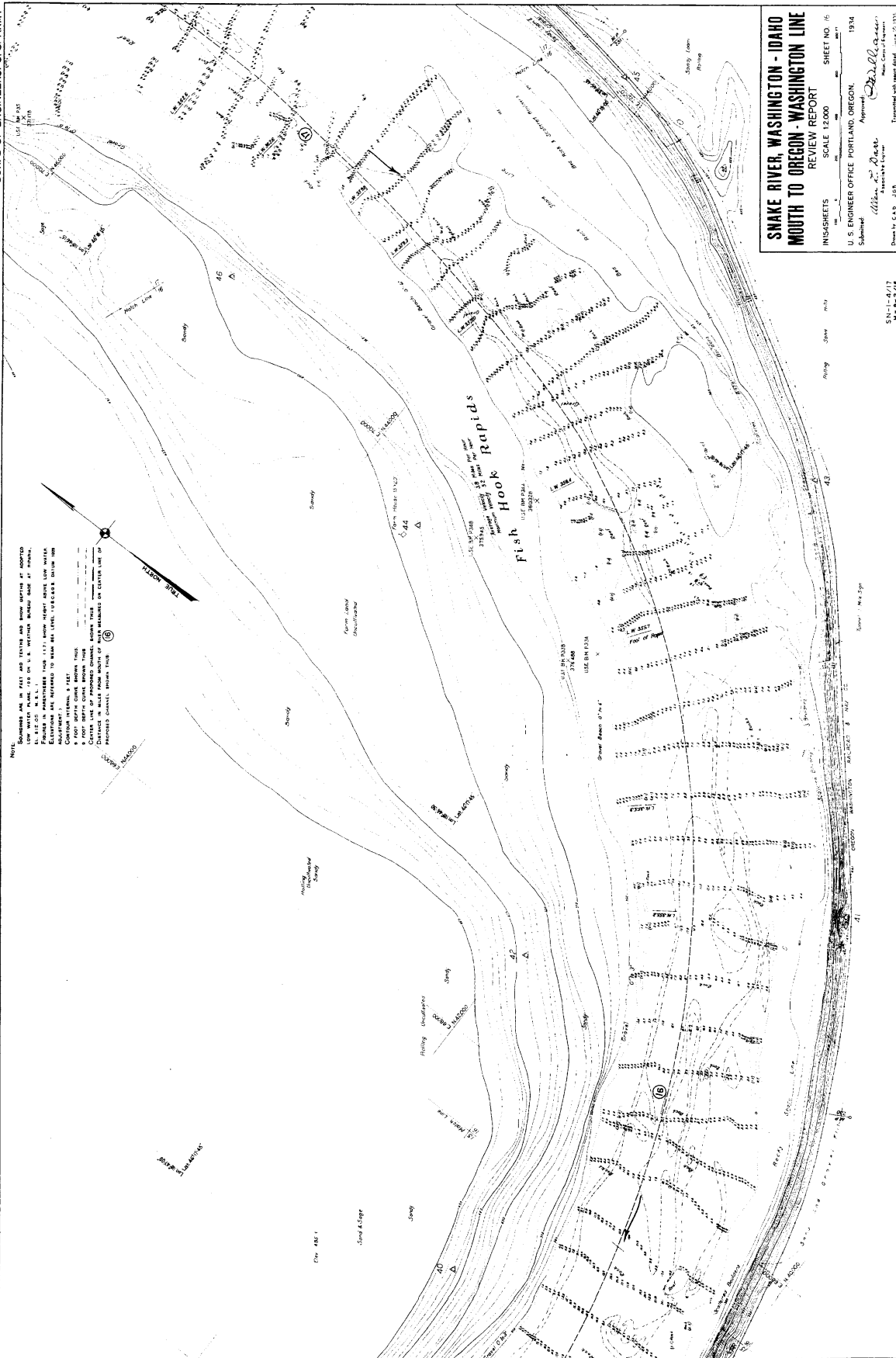
Wm. B. Davis
John C. Linn

Assistant Engineer Chief of Engineers

Drawn by C.L.B. J.C.B.

Transmitted with report dated Jan. 8, 1935.

SN-11-12715



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

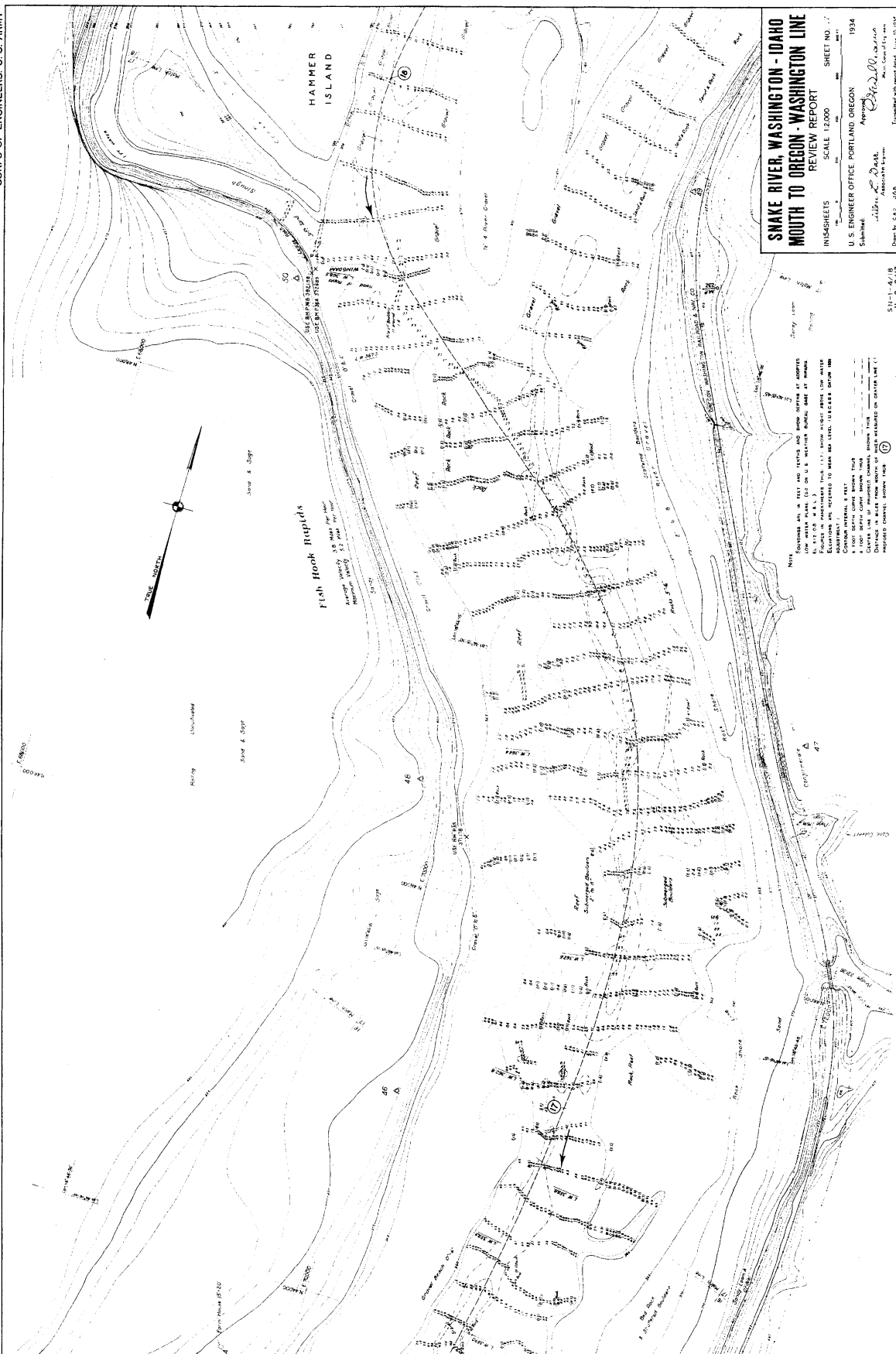
IN 154 SHEETS SCALE 1:2,000 SHEET NO. 16

Submitted: _____ Approved: _____

Walter A. Darr
Associate Engineer

Arthur K. Adams
Major, Corps of Engineers

Drawn by C A D JGH
Transmitted with report dated June 29 1952
SN-1-12/16



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

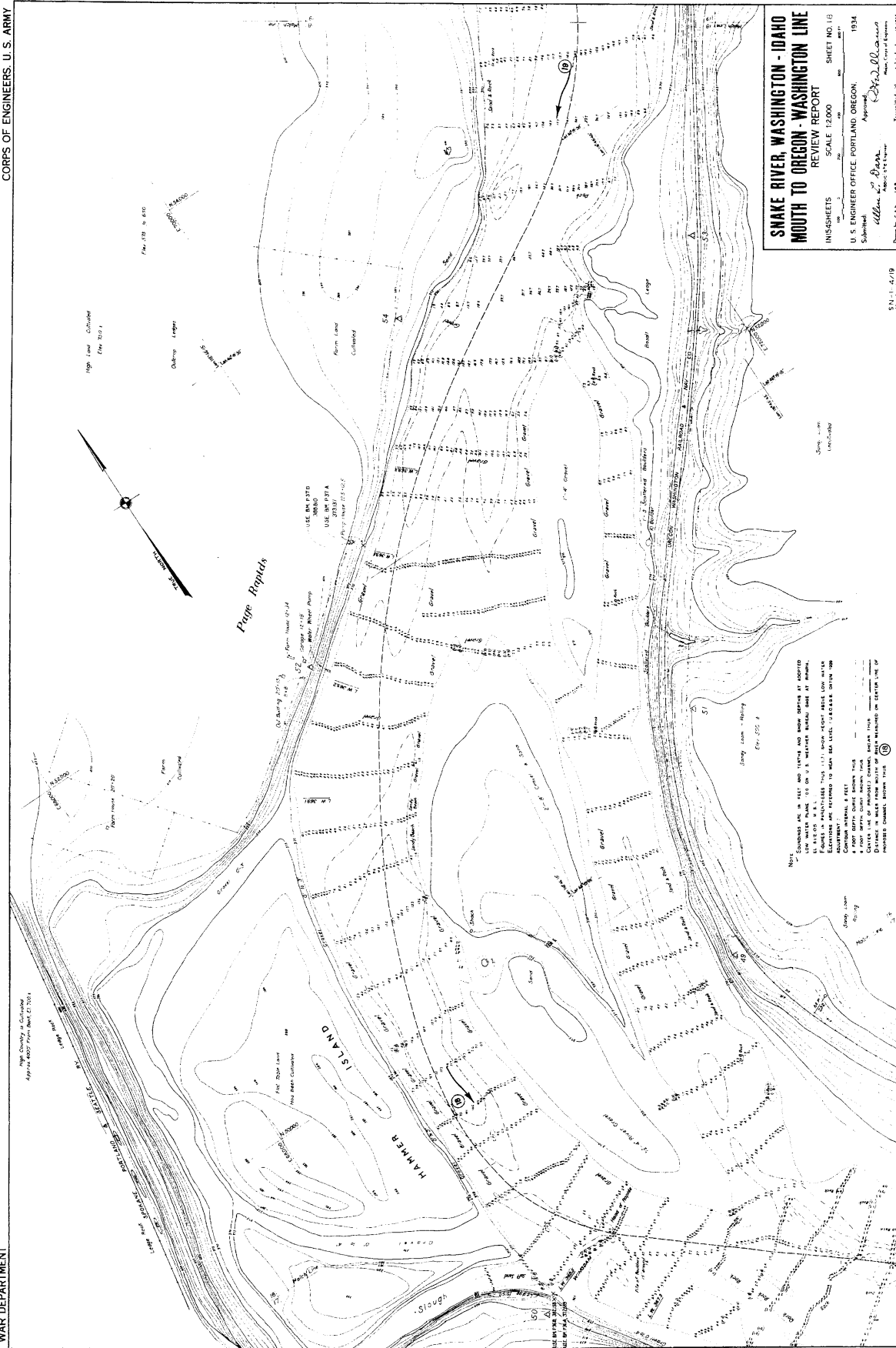
SHEET NO. 17
SCALE 1:2000
NIN54SHEETS

J. S. ENGINEER OFFICE, PORTLAND, OREGON 1934

Submitted: Approved: *[Signature]*
William L. Barr
Associate Engineer

Transmitted with copies to: Mr. Corps of Engineers
for C&D - 1678

SN-1-12/17



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

IN 154 SHEETS SCALE 1:2,000 SHEET NO. 18

U. S. ENGINEER OFFICE, PORTLAND, OREGON, 1934.

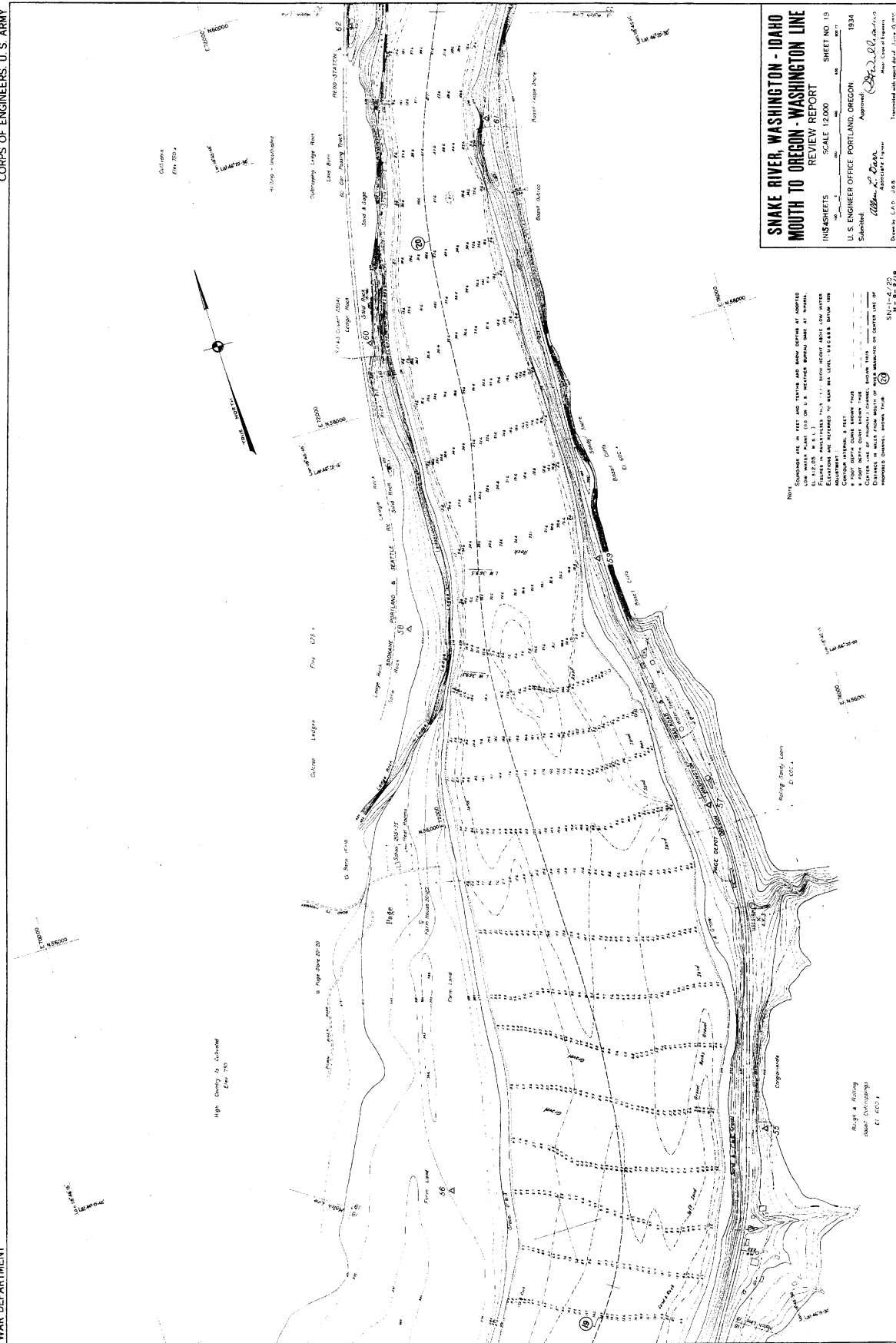
Submitted: Allen L. Barr
Approved: [Signature]

[illegible]

Drawn by C A B J A B
Transmitted with report dated June 10 1937
S A I - 13 / 18

Origin of CAB JNB
Transmitted with report dated June 10/1957
SN-1-12/18

91271-1-MC



NOTES

1. ELEVATIONS ARE IN FEET AND TENTHS AND SHOW HEIGHTS AS ADJUSTED TO MEAN SEA LEVEL. 100 FEET OR MORE BELOW MEAN SEA LEVEL ARE SHOWN AS NEGATIVE.

2. FINISHES IN PARENTHESES SHOW 100 FEET BELOW HEIGHT ABOVE LOW WATER.

3. ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL, 1929 C.E. & S. DATA 1929.

4. CIRCULAR INTERSECTIONS ARE NOT SHOWN.

5. A FOOT SCALE BAR IS SHOWN.

6. DISTANCE OF 100 FEET IS SHOWN.

7. DISTANCE OF 100 FEET IS SHOWN.

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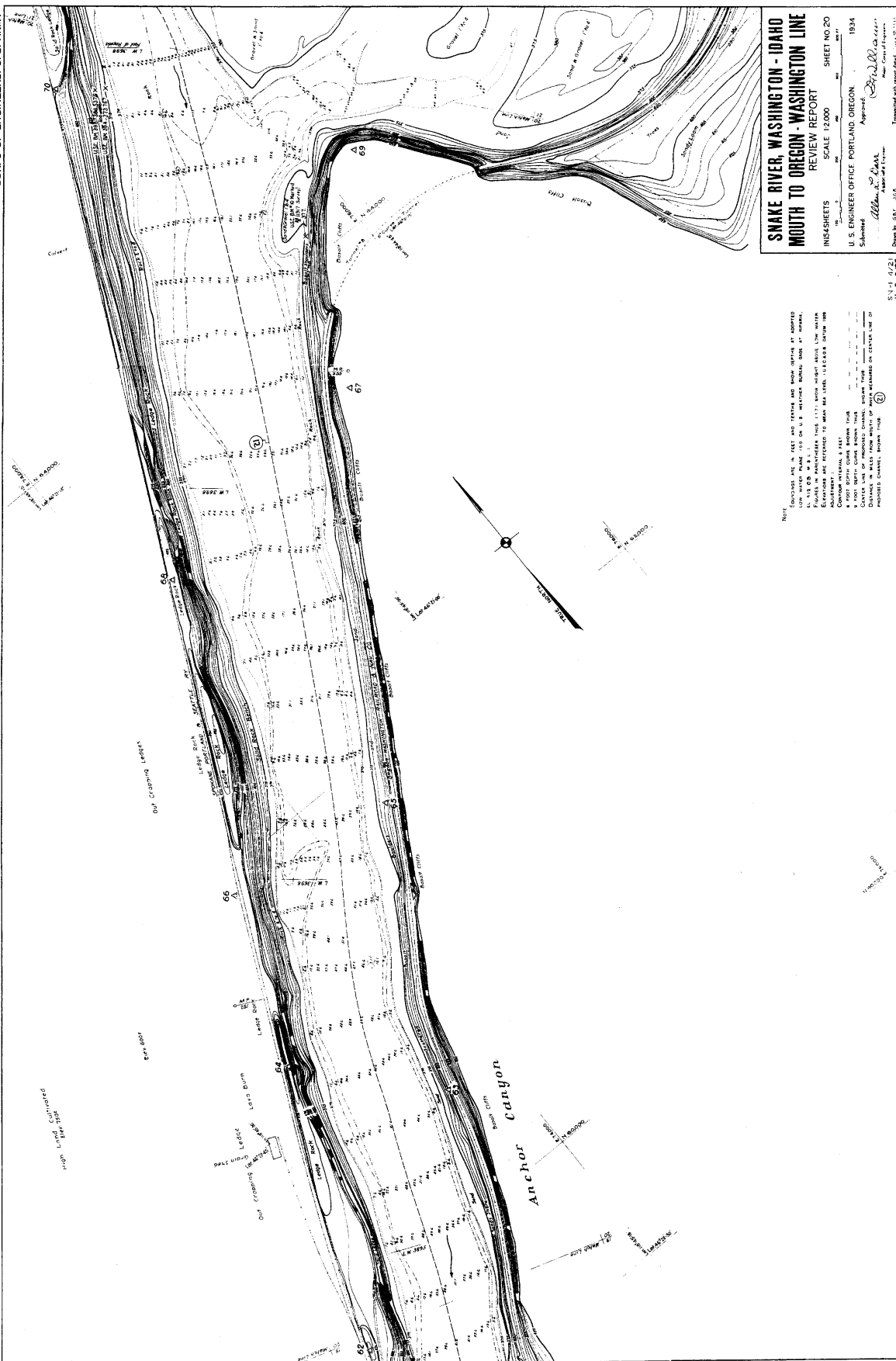
97. DISTANCE OF 100 FEET IS SHOWN.

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100. DISTANCE OF 100 FEET IS SHOWN.

SN-1-12/19



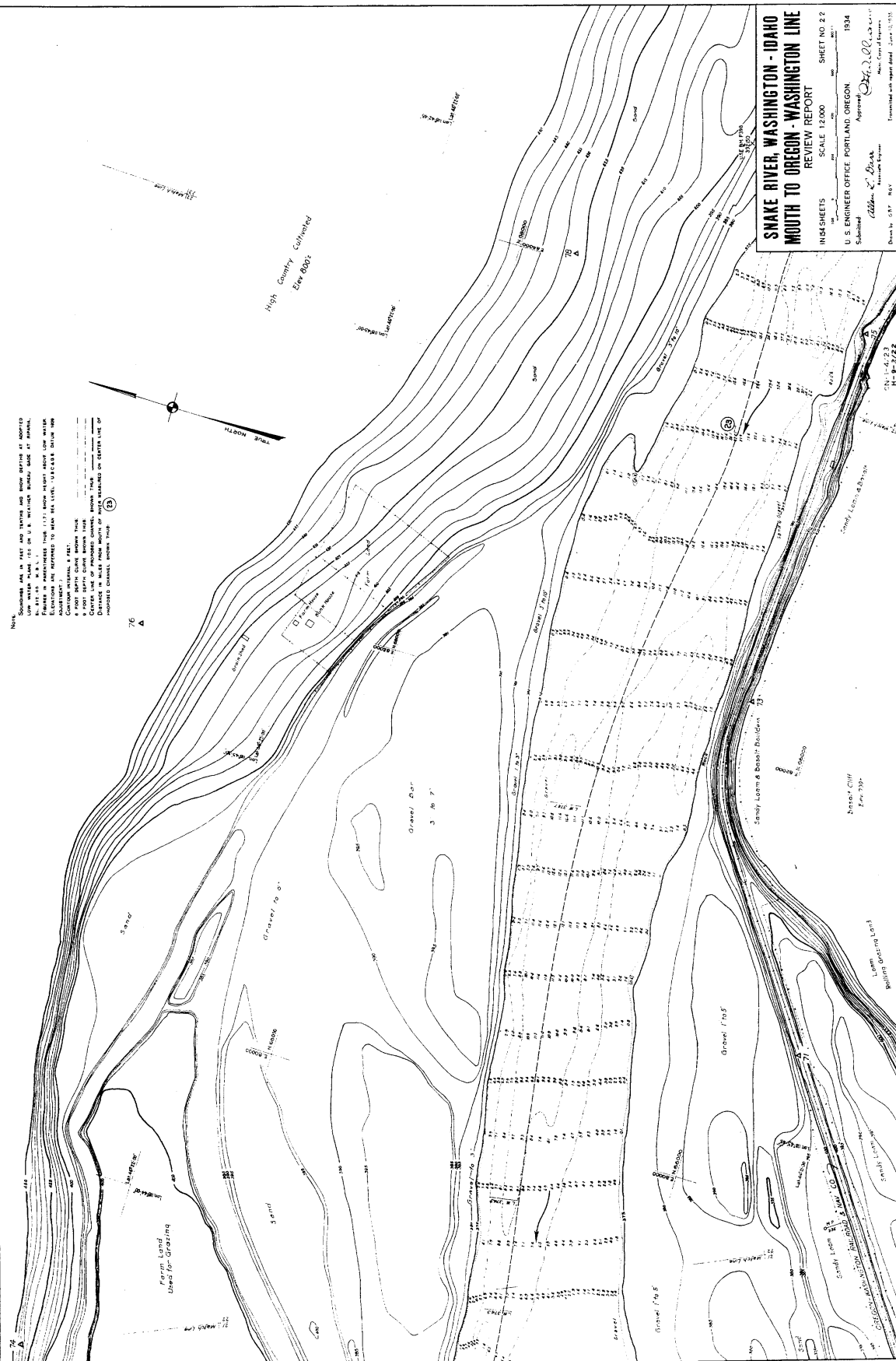
SNAKE RIVER, WASHINGTON - IDAHO
 MOUTH TO OREGON - WASHINGTON LINE
 REVIEW REPORT
 SHEET NO. 20
 SCALE 12,000
 SHEETS
 U. S. ENGINEERING OFFICE PORTLAND, OREGON
 1934
 Submitted
 Approved: *Allen W. Lane*
Byrdell
 Transmitted with original drawings
 Approved by: 687-164
 100-131



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**
REVIEW REPORT
U.S. ENGINEER OFFICE PORTLAND, OREGON
SHEET NO. 21
SCALE 12,000
INCHES
Submitted: *May 20, 1934*
Checked: *May 20, 1934*
Approved: *May 20, 1934*
Transmitted with report dated: *May 20, 1934*
Drawn by: *May 20, 1934*
M-9-228

SN-1-12/21

NOTE:
1. ELEVATIONS ARE IN FEET AND DECIMALS THEREOF.
2. LOW WATER PLANT 120 ON A 1/2 SECTION BATHY THERMOGRAPH.
3. ELEVATIONS ARE BASED ON MEAN SEA LEVEL.
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**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
REVIEW REPORT**

NS4 SHEETS SCALE 1:2000 SHEET NO. 22

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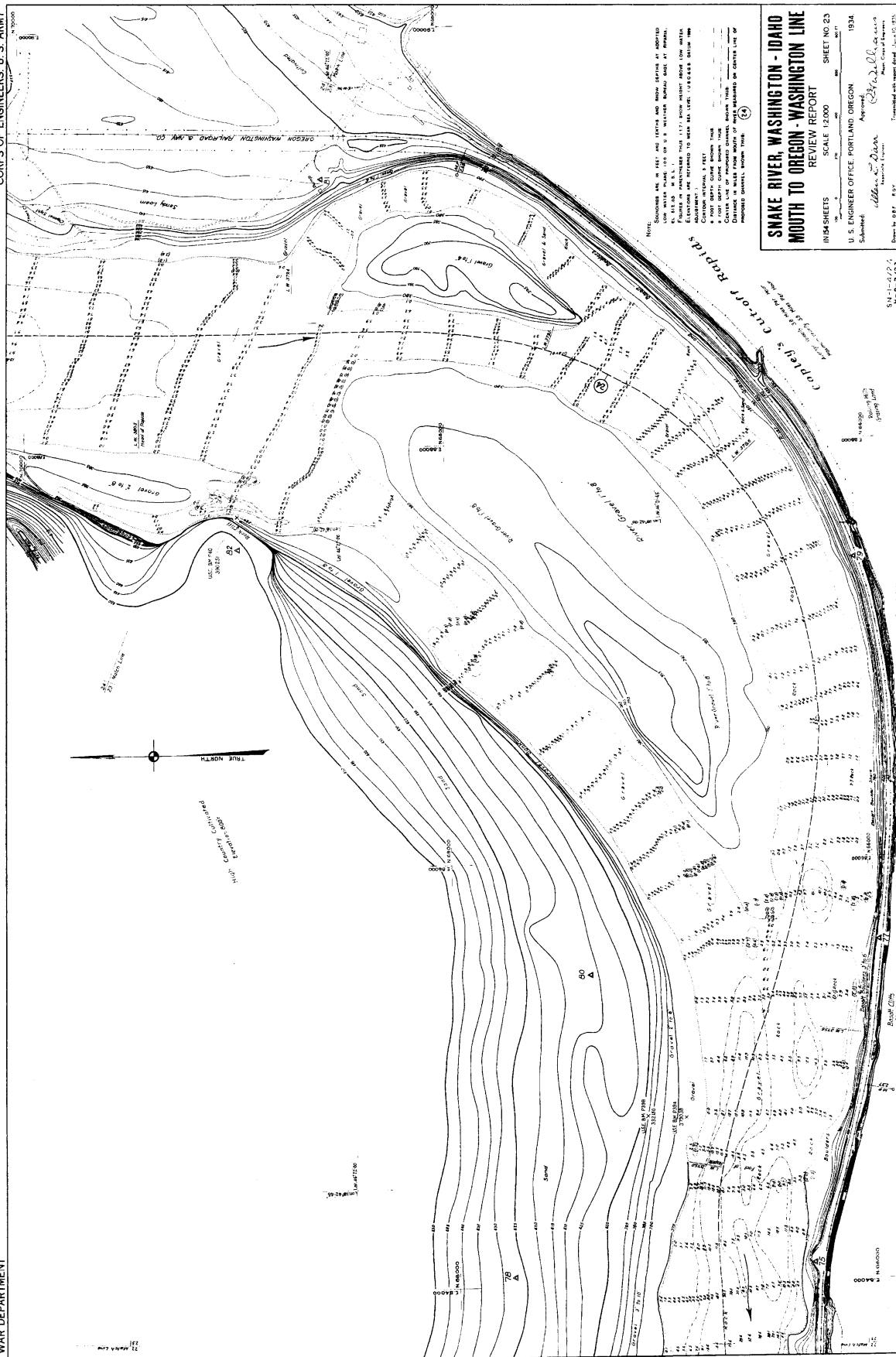
U. S. ENGINEER OFFICE PORTLAND, OREGON 1934

Approved: *John J. O'Connor* Acting Chief of Engineers

Submitted: *William E. Davis* Assistant Engineer

Drawn by: G.E.T. R.G.V. Transmitted with report dated June 10, 1935.

SN-1-12/22



SPINDLES ARE IN 150' AND 100' AND 50' AND 25' AND 10' AND 5' AND 2' AND 1' AND 1/2' AND 3/4' AND 1/4' AND 1/8' AND 1/16' AND 1/32' AND 1/64' AND 1/128' AND 1/256' AND 1/512' AND 1/1024' AND 1/2048' AND 1/4096' AND 1/8192' AND 1/16384' AND 1/32768' AND 1/65536' AND 1/131072' AND 1/262144' AND 1/524288' AND 1/1048576' AND 1/2097152' AND 1/4194304' AND 1/8388608' AND 1/16777216' AND 1/33554432' AND 1/67108864' AND 1/134217728' AND 1/268435456' AND 1/536870912' AND 1/1073741824' AND 1/2147483648' AND 1/4294967296' AND 1/8589934592' AND 1/17179869184' AND 1/34359738368' AND 1/68719476736' AND 1/137438953472' AND 1/274877907544' AND 1/549755815088' AND 1/1099511630176' AND 1/2199023260352' AND 1/4398046520704' AND 1/8796093041408' AND 1/17592186082816' AND 1/35184372165632' AND 1/70368744331264' AND 1/140737488662528' AND 1/281474977325056' AND 1/562949954650112' AND 1/1125899909300224' AND 1/2251799818600448' AND 1/4503599637200896' AND 1/9007199274401792' AND 1/18014398548803584' AND 1/36028797097607168' AND 1/72057594195214336' AND 1/144115188390428672' AND 1/288230376780857344' AND 1/576460753561714688' AND 1/1152921507123429376' AND 1/2305843014246858752' AND 1/4611686028493717504' AND 1/9223372056987435008' AND 1/18446744113974870016' AND 1/36893488227949740032' AND 1/73786976455899480064' AND 1/147573952911798960128' AND 1/295147905823597920256' AND 1/590295811647195840512' AND 1/1180591623294391681024' AND 1/2361183246588783362048' AND 1/4722366493177566724096' AND 1/9444732986355133448192' AND 1/18889465972710266896384' AND 1/37778931945420533792768' AND 1/75557863890841067585536' AND 1/151115727781682135171072' AND 1/302231455563364270342144' AND 1/604462911126728540684288' AND 1/1208925822253457081368576' AND 1/2417851644506914162737152' AND 1/4835703289013828325474304' AND 1/9671406578027656650948608' AND 1/19342813156055313301897216' AND 1/38685626312110626603794432' AND 1/77371252624221253207588864' AND 1/154742505248442506415177728' AND 1/309485010496885012830355456' AND 1/618970020993770025660710912' AND 1/1237940041987540051321421824' AND 1/2475880083975080102642843648' AND 1/4951760167950160205285687296' AND 1/9903520335900320410571374592' AND 1/198070406718006408211427488' AND 1/396140813436012816422854976' AND 1/792281626872025632845709952' AND 1/1584563253744051265691419904' AND 1/3169126507488102531382839808' AND 1/6338253014976205062765679616' AND 1/12676506029952410125531359232' AND 1/25353012059904820251062718464' AND 1/50706024119809640502125436928' AND 1/101412048239619281004250873856' AND 1/202824096479238562008501747712' AND 1/405648192958477124017003495424' AND 1/811296385916954248034006990848' AND 1/1622592771833908496068013981696' AND 1/3245185543667816992136027963392' AND 1/6490371087335633984272055926784' AND 1/12980742174671267968544111853568' AND 1/25961484349342535937088223707136' AND 1/51922968698685071874176447414272' AND 1/103845937397370143748352894828544' AND 1/207691874794740287496705789657088' AND 1/415383749589480574993411579314176' AND 1/830767499178961149986823158628352' AND 1/1661534998357922299973646317256704' AND 1/3323069996715844599947292634513408' AND 1/6646139993431689199894585269026816' AND 1/13292279986863378399789170538053632' AND 1/26584559973726756799578341076107264' AND 1/53169119947453513599156682152214528' AND 1/106338239894907027198313364304428672' AND 1/212676479789814054396626728608857344' AND 1/425352959579628108793253457217714688' AND 1/850705919159256217586506914435429376' AND 1/1701411838318512435173013828870858752' AND 1/3402823676637024870346027657741717504' AND 1/6805647353274049740692055315483435008' AND 1/13611294706548099481384110630966870016' AND 1/27222589413096198962768221261933740032' AND 1/54445178826192397925536442523867480064' AND 1/108890357652384795851072885047734960128' AND 1/217780715304769591702145770095469920256' AND 1/435561430609539183404291540190939840512' AND 1/871122861219078366808583080381879681024' AND 1/1742245722438156733617166160763759362048' AND 1/3484491444876313467234332321527518724096' AND 1/6968982889752626934468664643055037448192' AND 1/13937965779505253868937329286110074896384' AND 1/27875931559010507737874658572220149792768' AND 1/55751863118021015475749317144440299585536' AND 1/111503726236042030951498634288880599171072' AND 1/223007452472084061902997268577761198342144' AND 1/446014904944168123805994537155522396684288' AND 1/892029809888336247611989074311044793368576' AND 1/178405961977667249522397814862208958673712' AND 1/356811923955334499044795629724417917347424' AND 1/7136238479106689980

**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

IN 54 SHEETS SCALE 1:2,000 SHEET NO. 23
100 0 200 400 600 800 FT
U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934.

U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934.

Associate Engineer	Major, Corps of Engineers
Comes by O & Y	Transmitted with various dated June 10, 1875.

SN-1-A12%

SN-1-12/23



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**
REVIEW REPORT

IN 54 SHEETS SCALE 1:2,000 SHEET NO. 24

U. S. ENGINEER OFFICE, PORTLAND, OREGON.

1934

Submitted: 11/11/2019 Approved: [Signature]

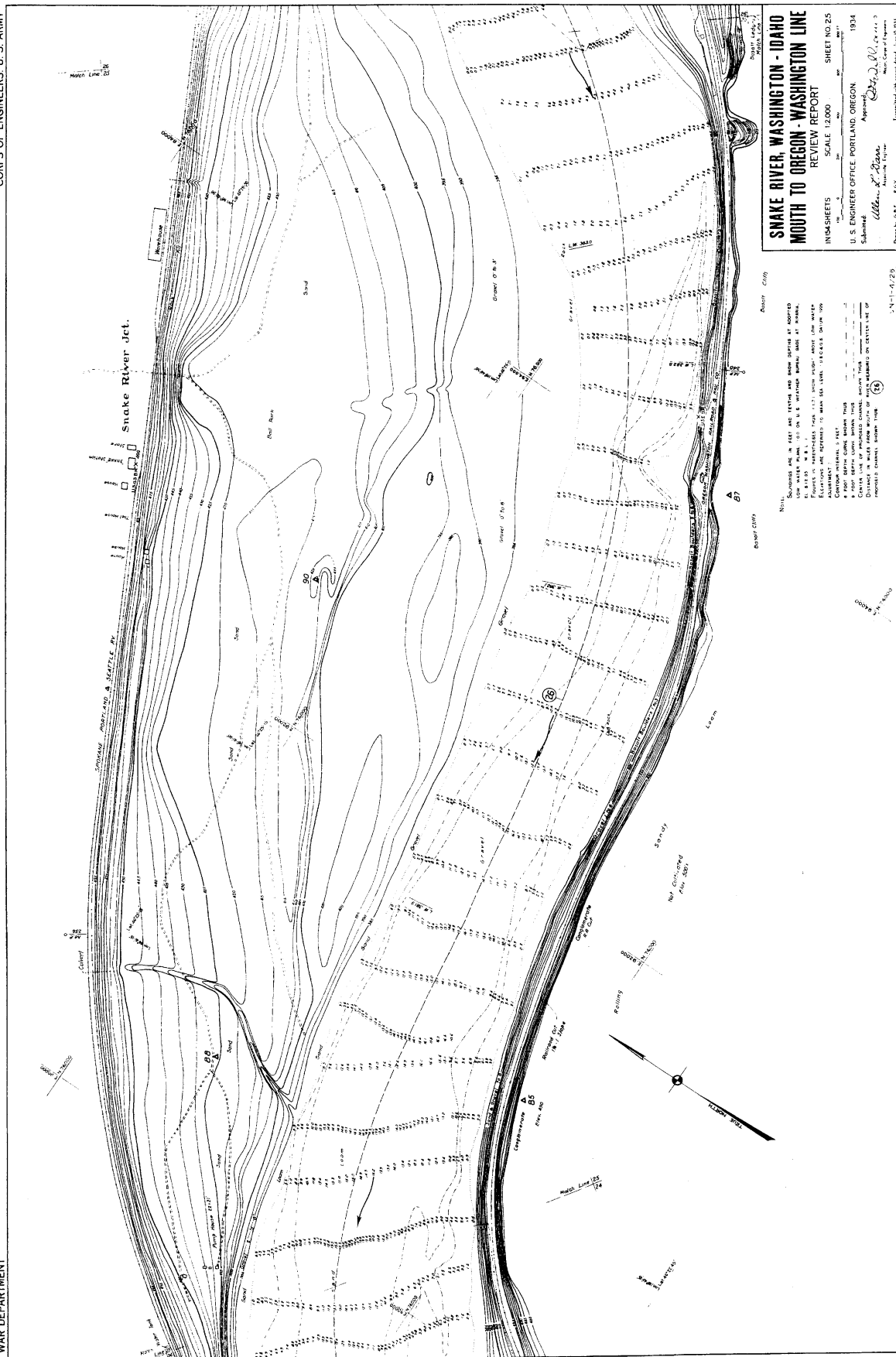
... .. **EXPERIENCE** **Available Engineer**

... .. **Major, Corps of Engineers**

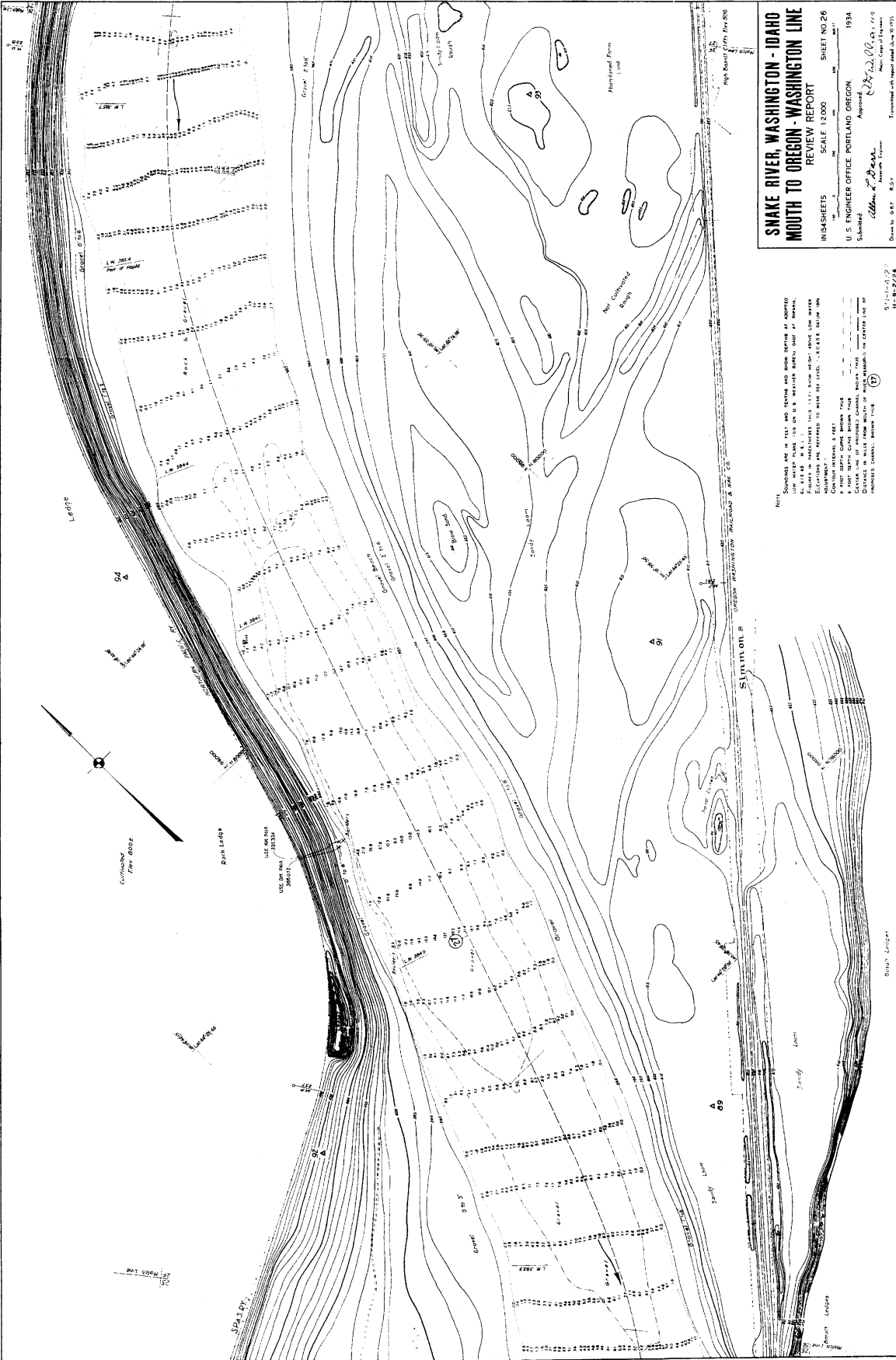
... .. **Transmitted with request dated Jan. 10, 1995.**

... .. **Drawn by GUY M.C.**

SN-1-12/24

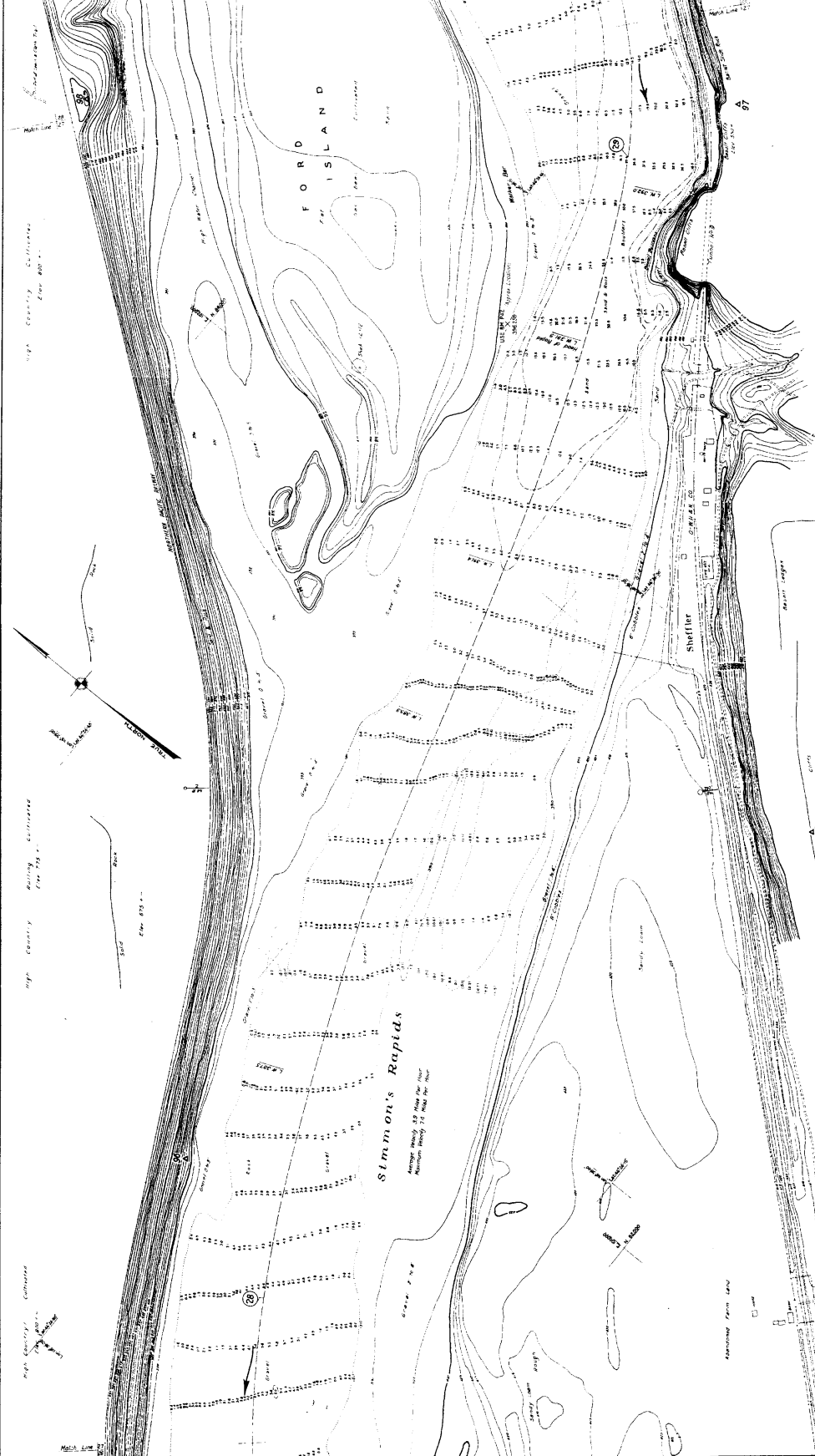


SNAKE RIVER, WASHINGTON - IDAHO
 MOUTH TO OREGON - WASHINGTON LINE
 REVIEW REPORT
 SHEET NO. 25
 SCALE 1:2,000
 INCHES-SHEETS
 U. S. ENGINEER OFFICE, PORTLAND, OREGON
 1934
 Approved: *Wm. L. Kane*
 Submitted: *Wm. L. Kane*
 Assistant Engineer
 Licensed with revision dated June 1934
 R. O. V.
 SN-1-12-125



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**
REVIEW REPORT
IN 14 SHEETS SCALE 12,000 SHEET NO 26
U. S. ENGINEER OFFICE PORTLAND, OREGON
Submitted *Wm. L. Beale* Approved *Wm. L. Beale* 1934
Drawn by G. E. R. S. V. Engraved with report dated June 10, 1935.
S N - 1-12/26

Notes:
SOUNDINGS ARE IN FEET AND TENTHS AND SHOW DEPTH AT LOWEST
LOW WATER PLANE. USE ON U. S. WATER SURVEY MAPS AT MEANS.
ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL. - ELEVATIONS IN FEET.
ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL. - ELEVATIONS IN FEET.
CONTOUR INTERVAL, 5 FEET.
GATEWAY LINE OF PROPOSED CANAL, BEYOND THIS
LINE, THE RIVER IS NOT SHOWN. THE RIVER IS NOT SHOWN
BEYOND THIS LINE. THE RIVER IS NOT SHOWN BEYOND THIS
LINE. THE RIVER IS NOT SHOWN BEYOND THIS LINE.



Snake River, Washington - Idaho
Mouth to Oregon - Washington Line
REVIEW REPORT

IN 54 SHEETS SCALE 1:2000 SHEET NO 27

U. S. ENGINEER OFFICE PORTLAND OREGON

Submitted: *W. L. L. L.*
 Approved: *W. L. L. L.*
 Assistant Engineer

Drawn by R. C. R. S. C.

Transmitted with report dated June 1913

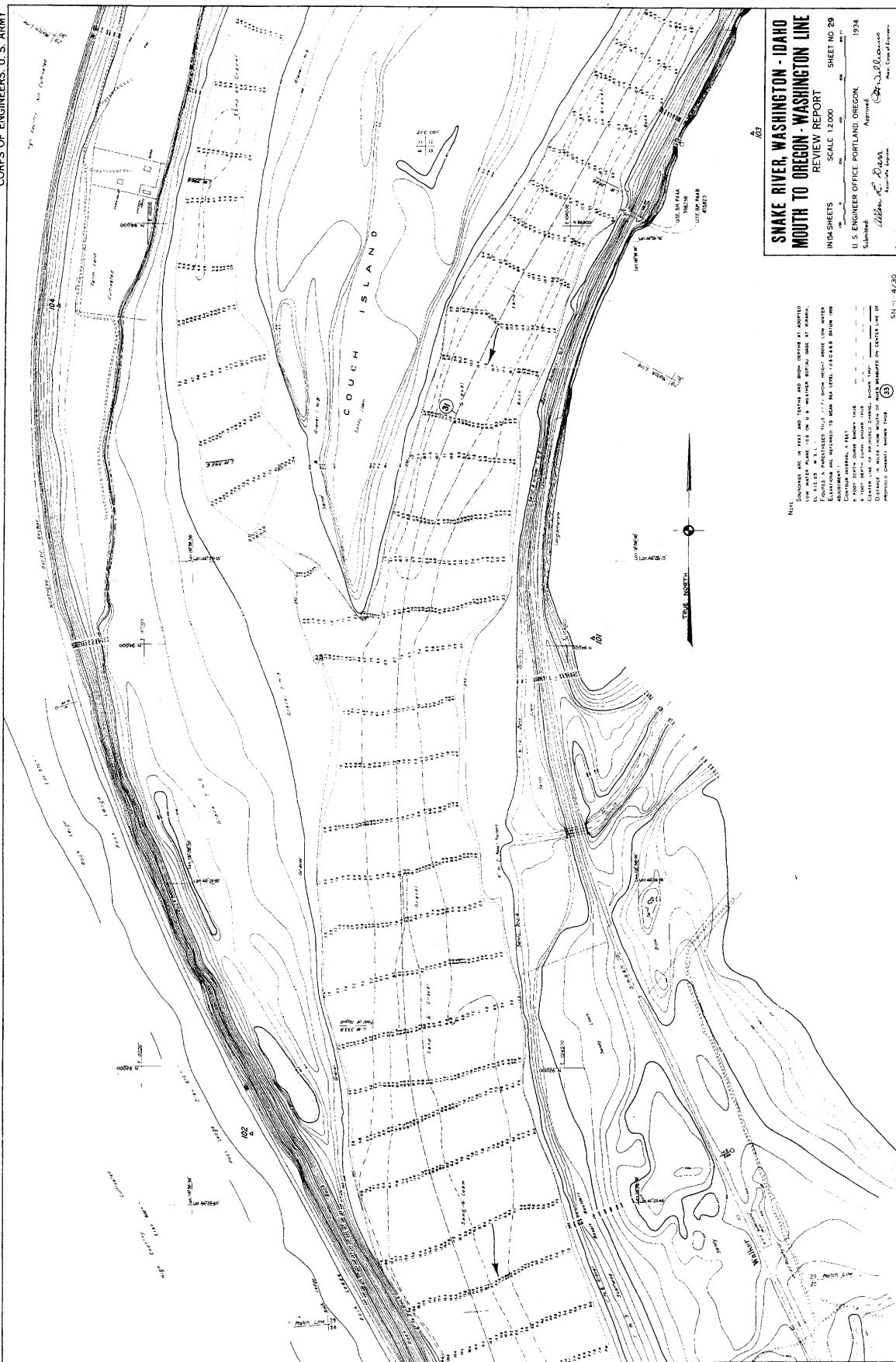
SN-1-12/27

NOTES:
 1. Surveys are in feet and yards and show datum at address.
 2. The river is 100 feet wide at the mouth of the river.
 3. The river is 100 feet wide at the mouth of the river.
 4. The river is 100 feet wide at the mouth of the river.
 5. The river is 100 feet wide at the mouth of the river.
 6. The river is 100 feet wide at the mouth of the river.
 7. The river is 100 feet wide at the mouth of the river.
 8. The river is 100 feet wide at the mouth of the river.
 9. The river is 100 feet wide at the mouth of the river.
 10. The river is 100 feet wide at the mouth of the river.



Snake River, Washington - Idaho Mouth to Oregon - Washington Line
REVIEW REPORT
 IN SHEETS SCALE 1:20,000 SHEET NO. 26
 U. S. ENGINEER OFFICE PORTLAND, OREGON
 Submitted *Allen S. Davis* Approved *W. H. L. Davis*
 Date of Report June 10, 1934
 Drawn by R. C. B. R. C. B.
 Transmitted with report dated June 10, 1934
 SN-12/28

NOTE:
 1. ELEVATIONS ARE IN FEET AND DECIMALS THEREOF AND HAVE BEEN ADJUSTED TO MEAN SEA LEVEL.
 2. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 3. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 4. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 5. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 6. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 7. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 8. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 9. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.
 10. ELEVATIONS ARE MEASURED TO MEAN SEA LEVEL, U.S. & A.S. MEASUREMENTS.



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
REVIEW REPORT**

IN 15 SHEETS SCALE 1:2,000 SHEET NO. 29

U. S. ENGINEER OFFICE, PORTLAND, OREGON, 1934.

U. S. ENGINEER OFFICE, PORTLAND, OREGON, 1934.

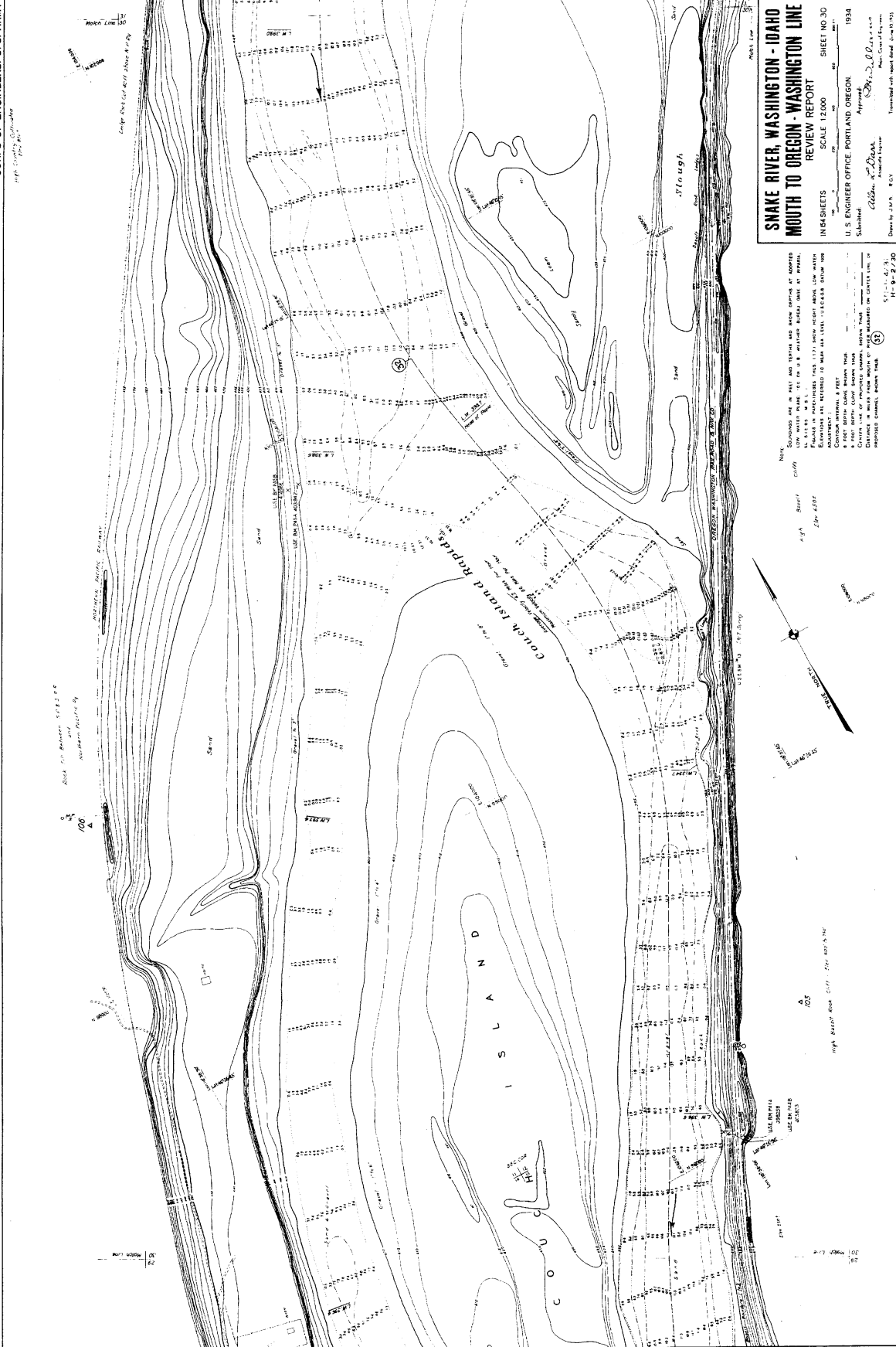
Submitted: _____ Approved: _____

Allen C. Carr
Stullman

Notes by R. C. W. H. G. V. Tension¹ and with consent dated June 15, 1939
Walter C. Long and Margaret

[illegible]

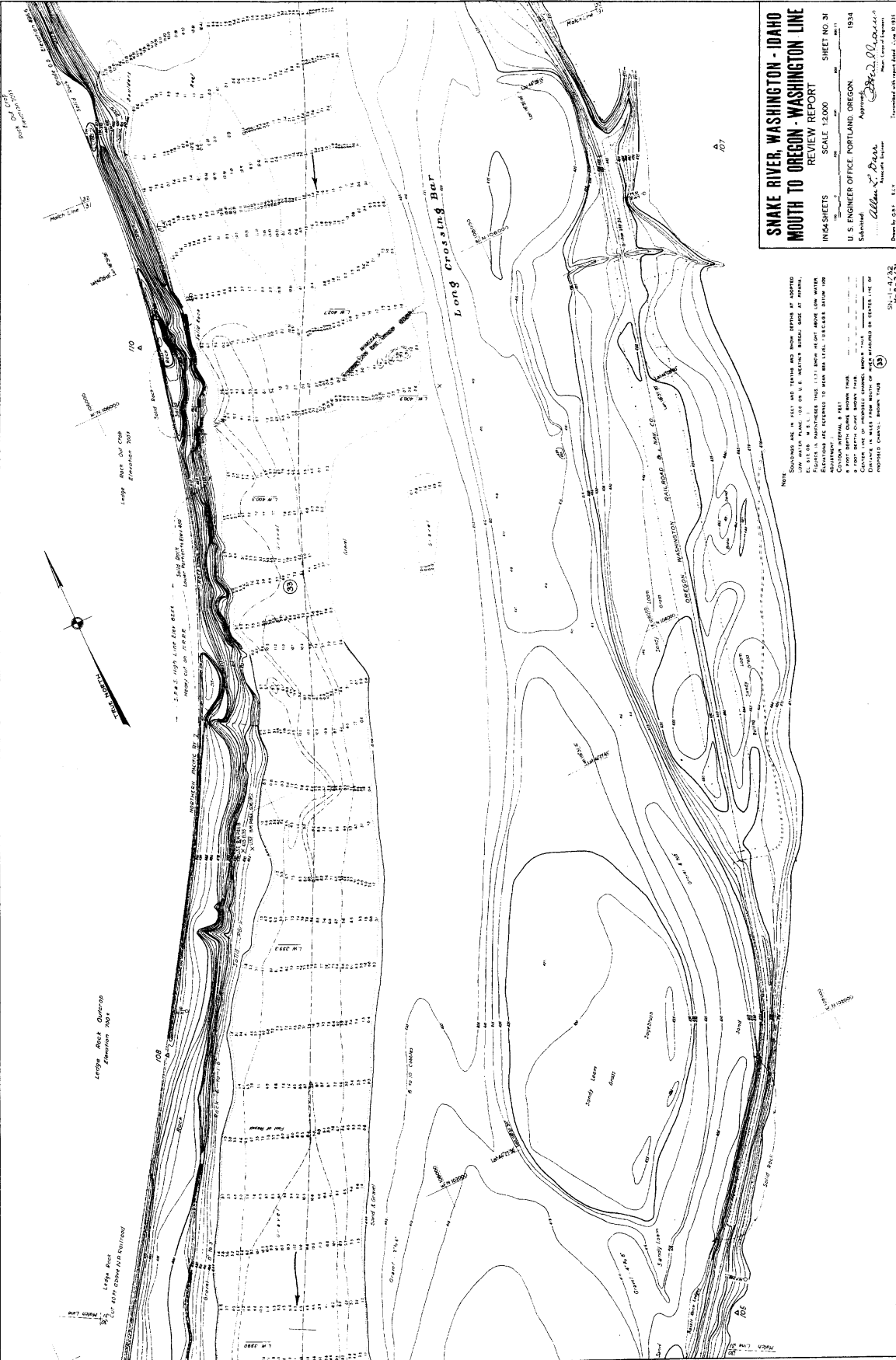
62721-1-NE



Snake River, Washington - Idaho
Mouth to Oregon - Washington Line
REVIEW REPORT
 IN 64 SHEETS SCALE 1:2000 SHEET NO 30
 U. S. ENGINEER OFFICE PORTLAND, OREGON
 Submitted: 1934
 Approved: [Signature]
 Date for J. E. P. 1934
 Transmitted with report dated June 10, 1935

Notes:
 1. Sections are in feet and inches and have been surveyed at right angles to the river. The river is 100 feet wide at the mouth of the river.
 2. The river is 100 feet wide at the mouth of the river.
 3. The river is 100 feet wide at the mouth of the river.
 4. The river is 100 feet wide at the mouth of the river.
 5. The river is 100 feet wide at the mouth of the river.
 6. The river is 100 feet wide at the mouth of the river.
 7. The river is 100 feet wide at the mouth of the river.
 8. The river is 100 feet wide at the mouth of the river.
 9. The river is 100 feet wide at the mouth of the river.
 10. The river is 100 feet wide at the mouth of the river.

SN-1-12/30



Snake River, Washington - Idaho Mouth to Oregon - Washington Line
 REVIEW REPORT
 SHEET NO. 31
 SCALE 12,000
 U. S. ENGINEER OFFICE PORTLAND, OREGON
 Submitted: *Wm. L. Davis*
 Approved: *Wm. L. Davis*
 Date: 10/1/1934
 Transmitted with report dated: June 19/1931
 SN-1-12731

NOTE
 1. This map was prepared from the original of the
 U. S. Army, War Department, and is not to be
 used for any other purpose.
 2. The map is not to be used for any other purpose.
 3. The map is not to be used for any other purpose.
 4. The map is not to be used for any other purpose.
 5. The map is not to be used for any other purpose.
 6. The map is not to be used for any other purpose.
 7. The map is not to be used for any other purpose.
 8. The map is not to be used for any other purpose.
 9. The map is not to be used for any other purpose.
 10. The map is not to be used for any other purpose.



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

REVIEW REPORT

SCALE 1:2,000

SHEET NO. 32

1934

U. S. ENGINEER OFFICE, PORTLAND, OREGON

Submitted

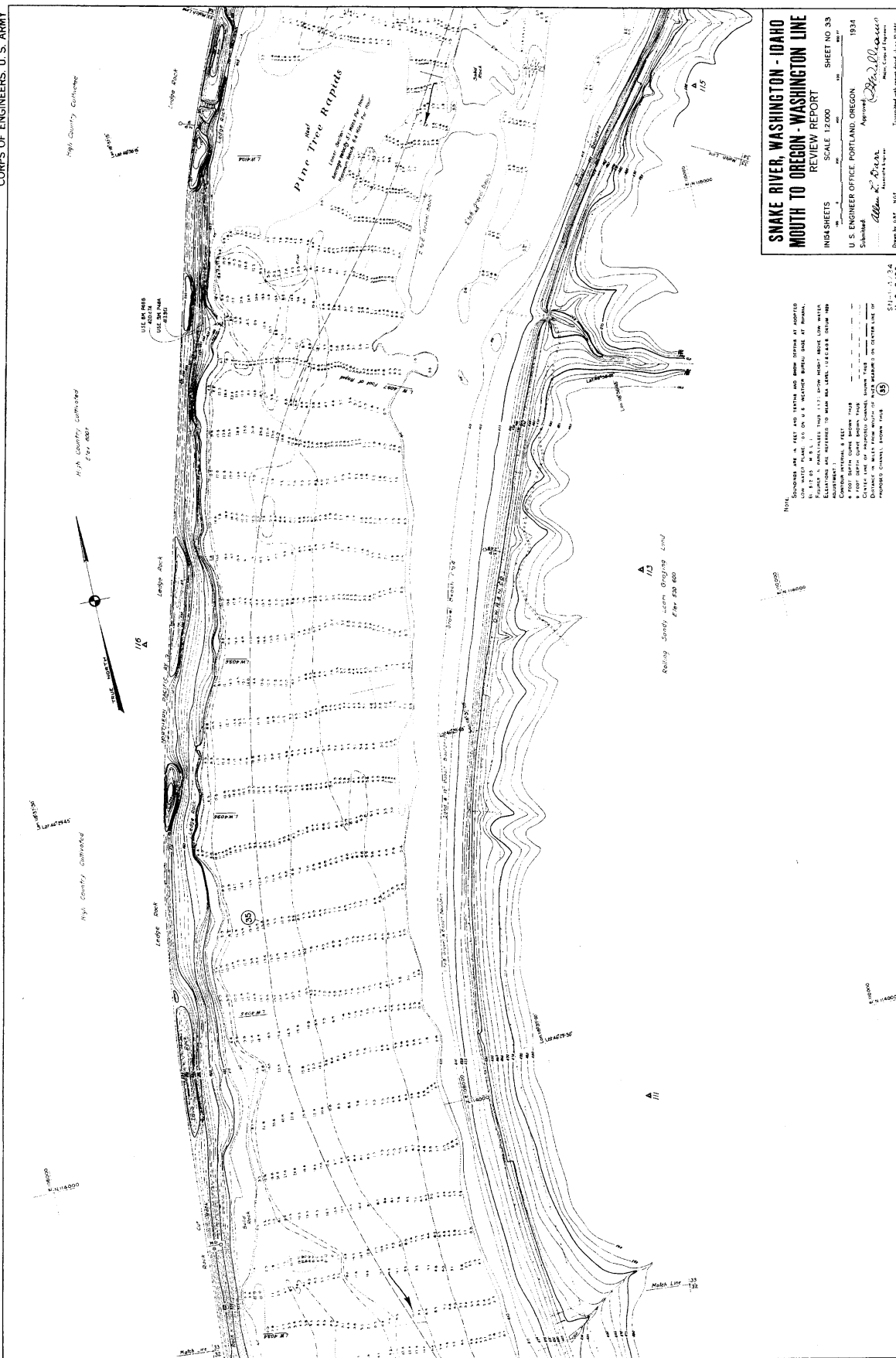
Approved: *Edw. W. Davis*

Checked: *Edw. W. Davis*

Prepared by: *Edw. W. Davis*

Transmitted at the same date as the report.

[illegible]



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

INIS SHEETS SCALE 12 000 REVIEW REPORT SHEET NO 33

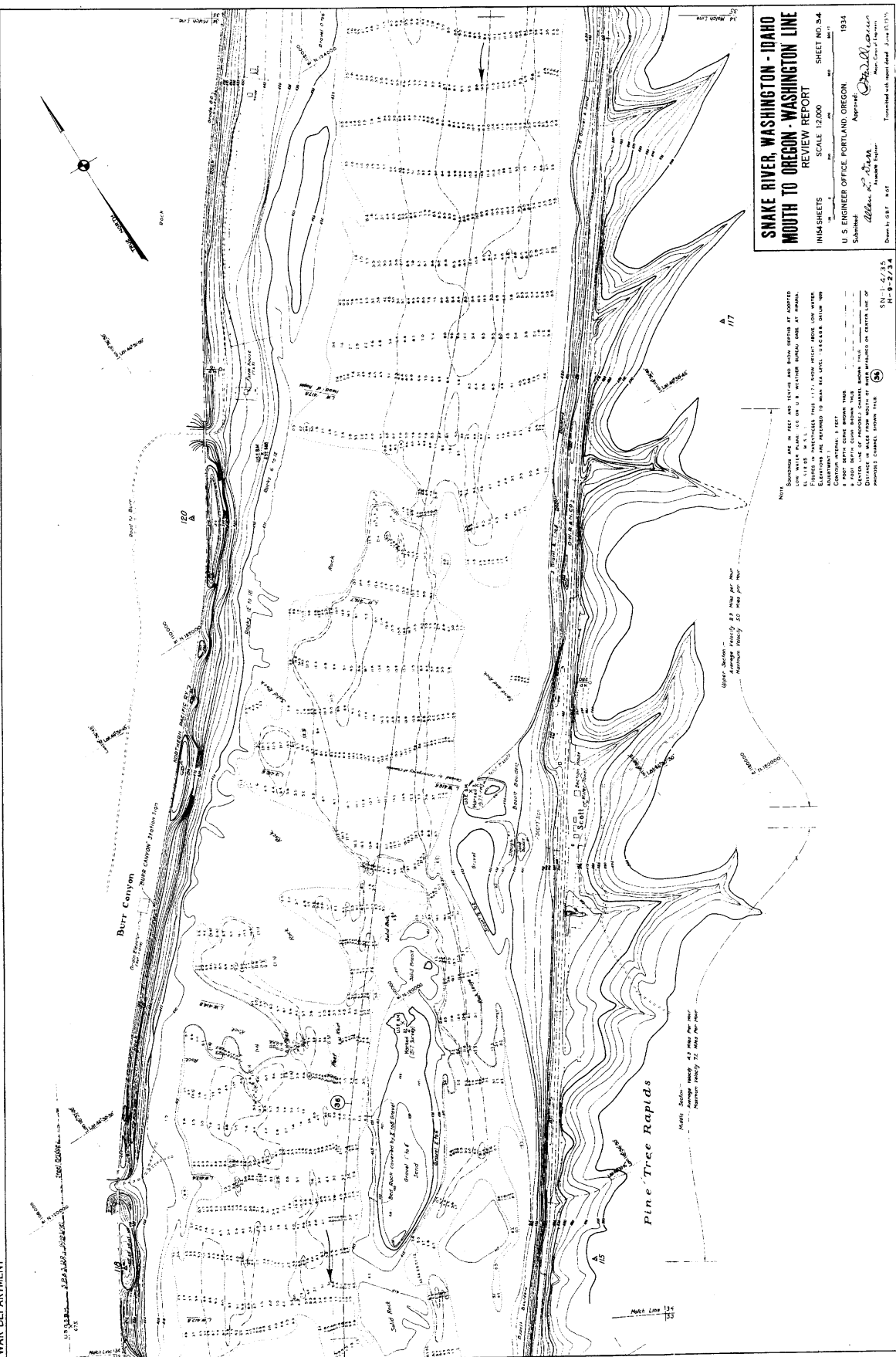
100 0 200 400 600 800 97

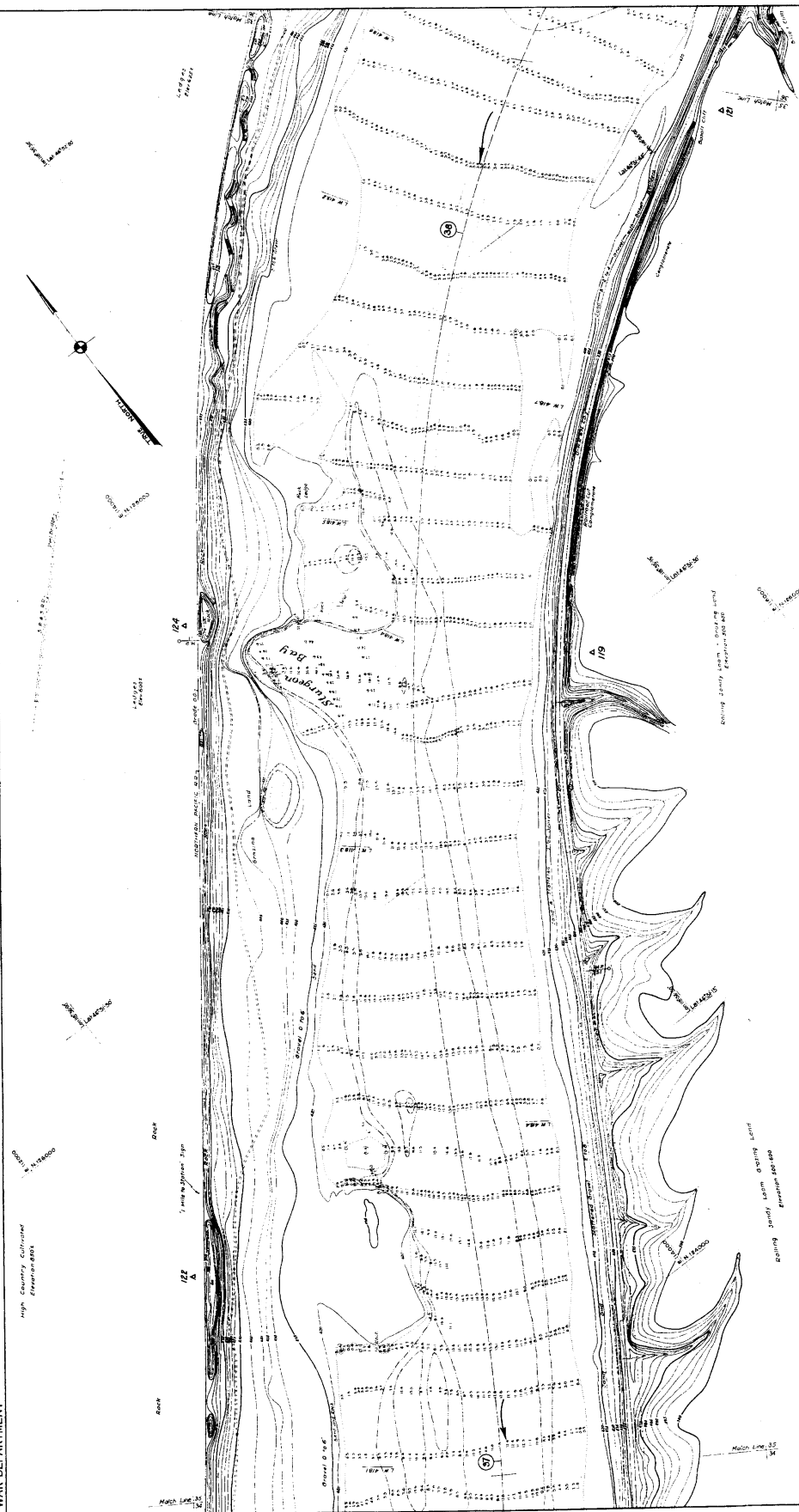
U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Submitted: Allen L. Barr Approved: Dr. Williams

Drawn by G. B. N. G. Transmitted with report dated June 10, 1935
Major, Corps of Engineers

5N-1-12/33





**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
REVIEW REPORT**

UNIS4 SHEETS SCALE 1:2000 SHEET NO 35

U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Allen L. Darr
Associate Engineer

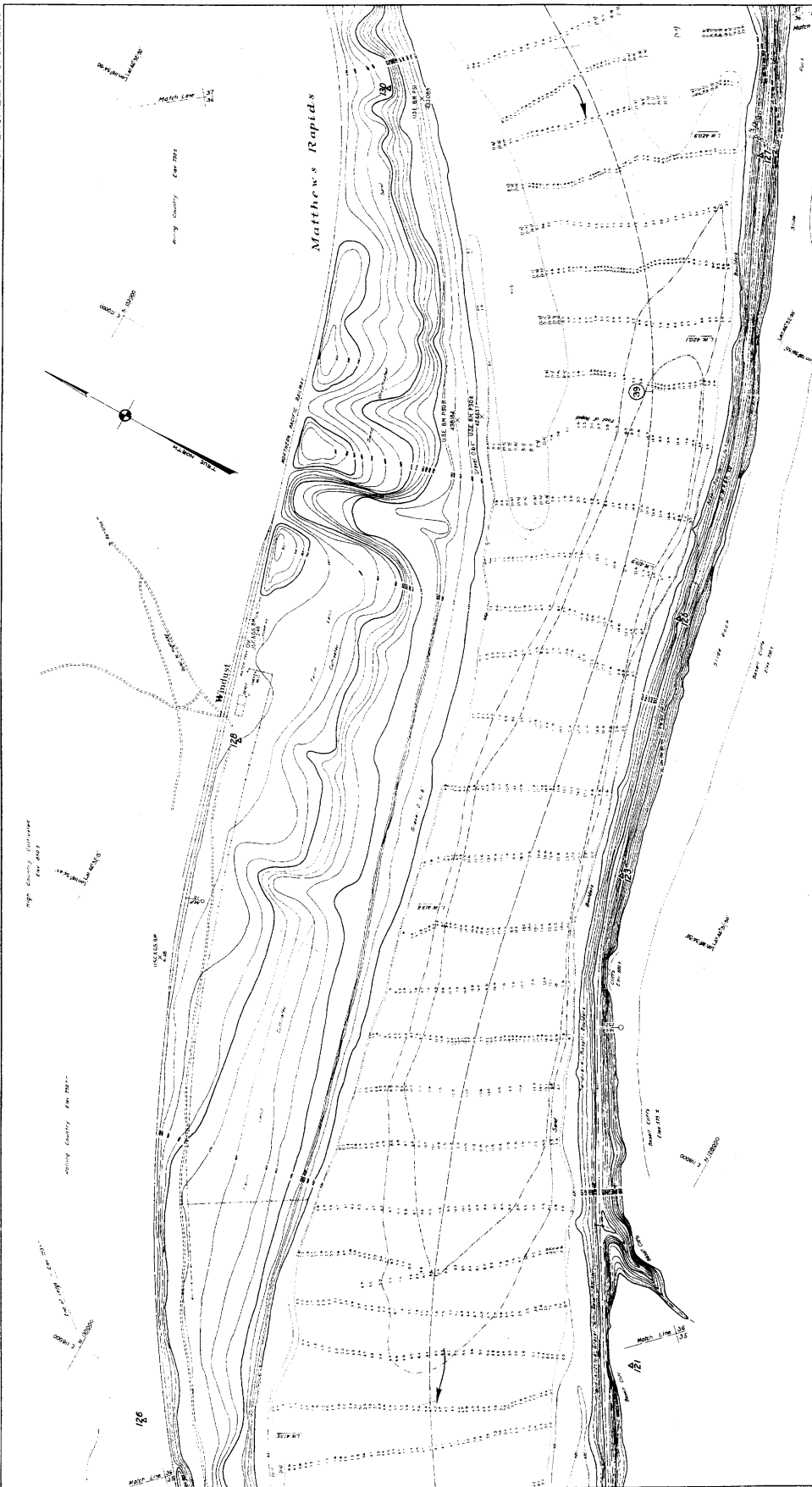
Donald L. Davis
Marine Corps of Engineers

Classified by 687 MOP
Transmitted with report dated June 12, 1958
SN-1-12/35

[illegible]

SN-1-4/36
H-9-2/35

SN-1-12/35



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line
REVIEW REPORT**

INSHSHEETS SCALE 1:2500 SHEET NO. 36

U.S. ENGINEER OFFICE PORTLAND, OREGON

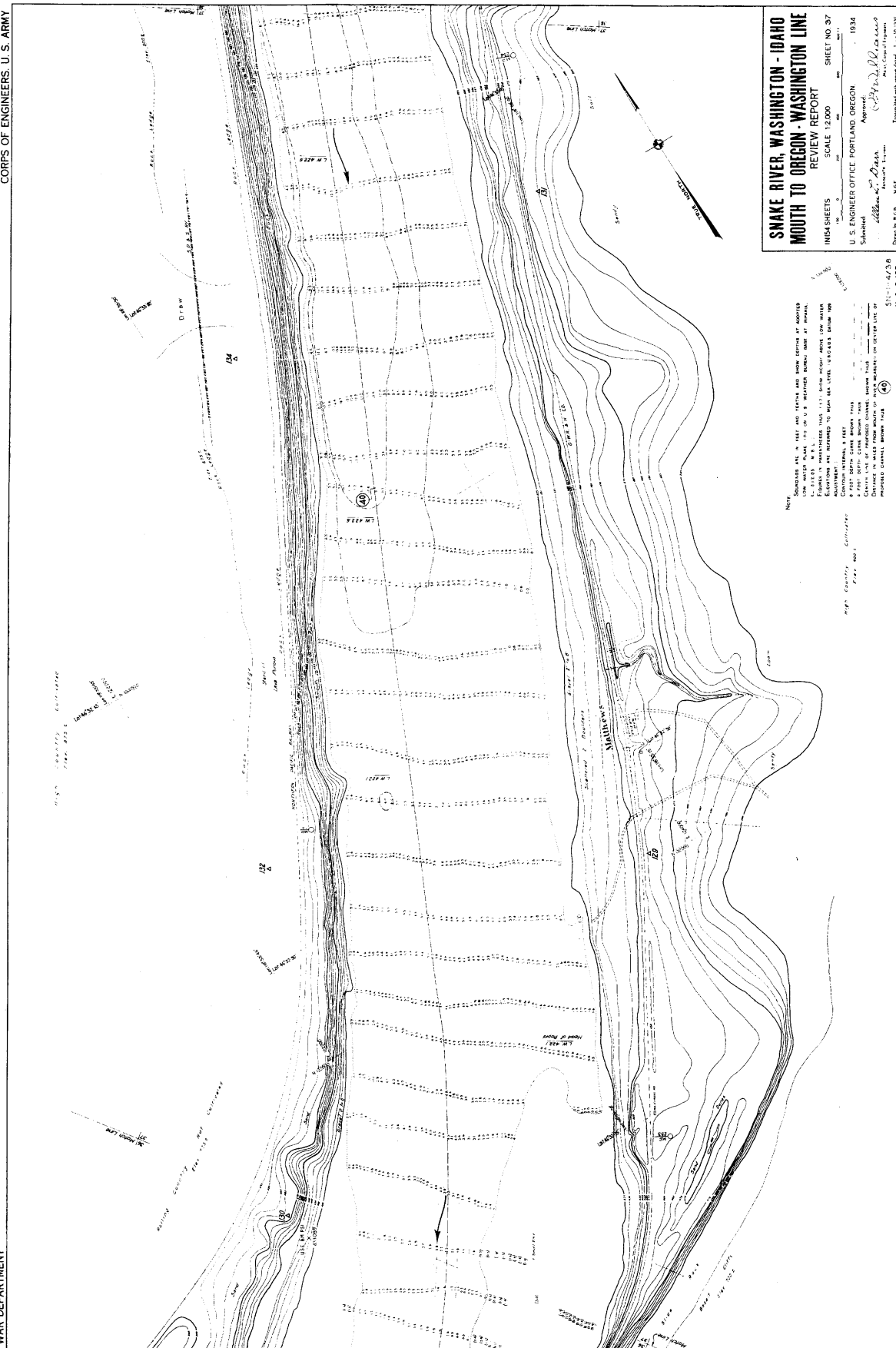
Submitted *W. L. Davis* Approved *W. L. Davis* 1934

Drawn by R. L. Davis

Transmitted with report dated June 1934

SN-1-12/36

NOTE: Sections are in feet and tenths and show section of mouth of low water plane. 100 on 100 feet water level at mouth. Elevation is approximately 100 feet above low water. Elevation is referred to mean sea level. 100 on 100 feet. Contour interval, 5 feet. A 100 feet contour line is shown. Center line of mouth of river is shown. Center line of mouth of river is shown. Center line of mouth of river is shown.



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

154 SHEETS SCALE 1:2,000 SHEET NO. 37

U. S. ENGINEER OFFICE, PORTLAND, OREGON.

William L. Dan
Associate Professor
Mary Cassatt Museum
Dorothy L. Davis

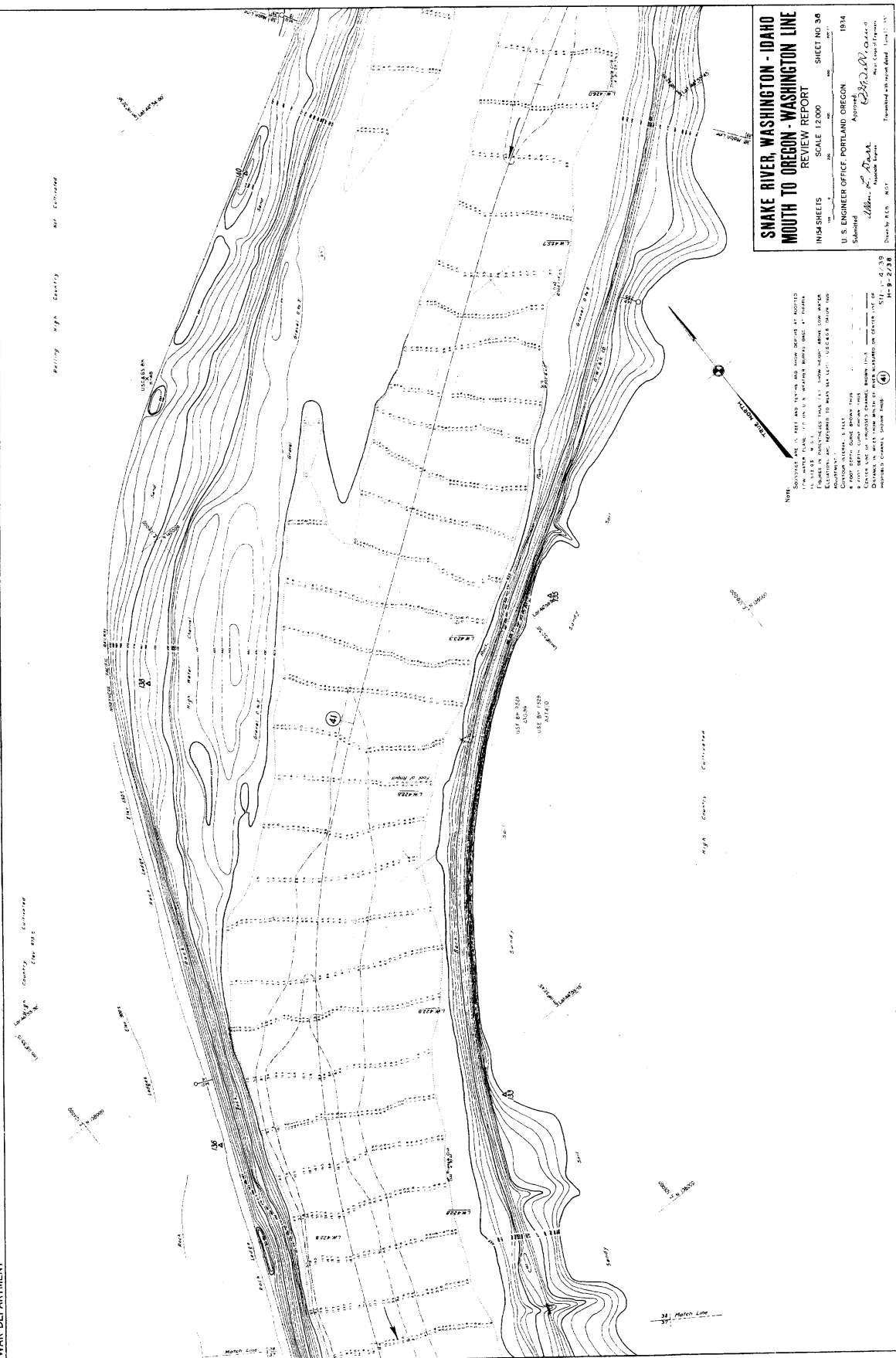
Drawn by RCB WCF Transmitted with report dated June 12 1935

SN-1-12/37

COORDINATES AND SHOW DEPTHS AT ADJOINED
 LOW WATER PLANE 100 ON U.S. WEATHER BUREAU MAP AT BIRMINGHAM.
 1-8105. M.A.L.T.
 FORMS IN PARENTHESES THIS 1937 SHOW HEIGHT ABOVE LOW WATER
 ELEVATIONS ARE REFERRED TO MEAN SEA LEVEL. U.S.C.O.S. DATUM 1929
 ADJUSTMENT.
 CONTOUR INTERVAL, 8 FEET
 FOOT DEPTH CURVE SHOWS THIS
 FOOT DEPTH. CURVE SHOWS THIS
 CENTIN LINE OF IMPROVED CHANNEL.
 DISTANCE IN MILES FROM MOUTH OF
 IMPROVED CHANNEL. SHOWS THIS
 CENTER LINE OF
 AVERAGE MEASUREMENT. CENTER LINE OF

2017-11-17 14:00:00

22



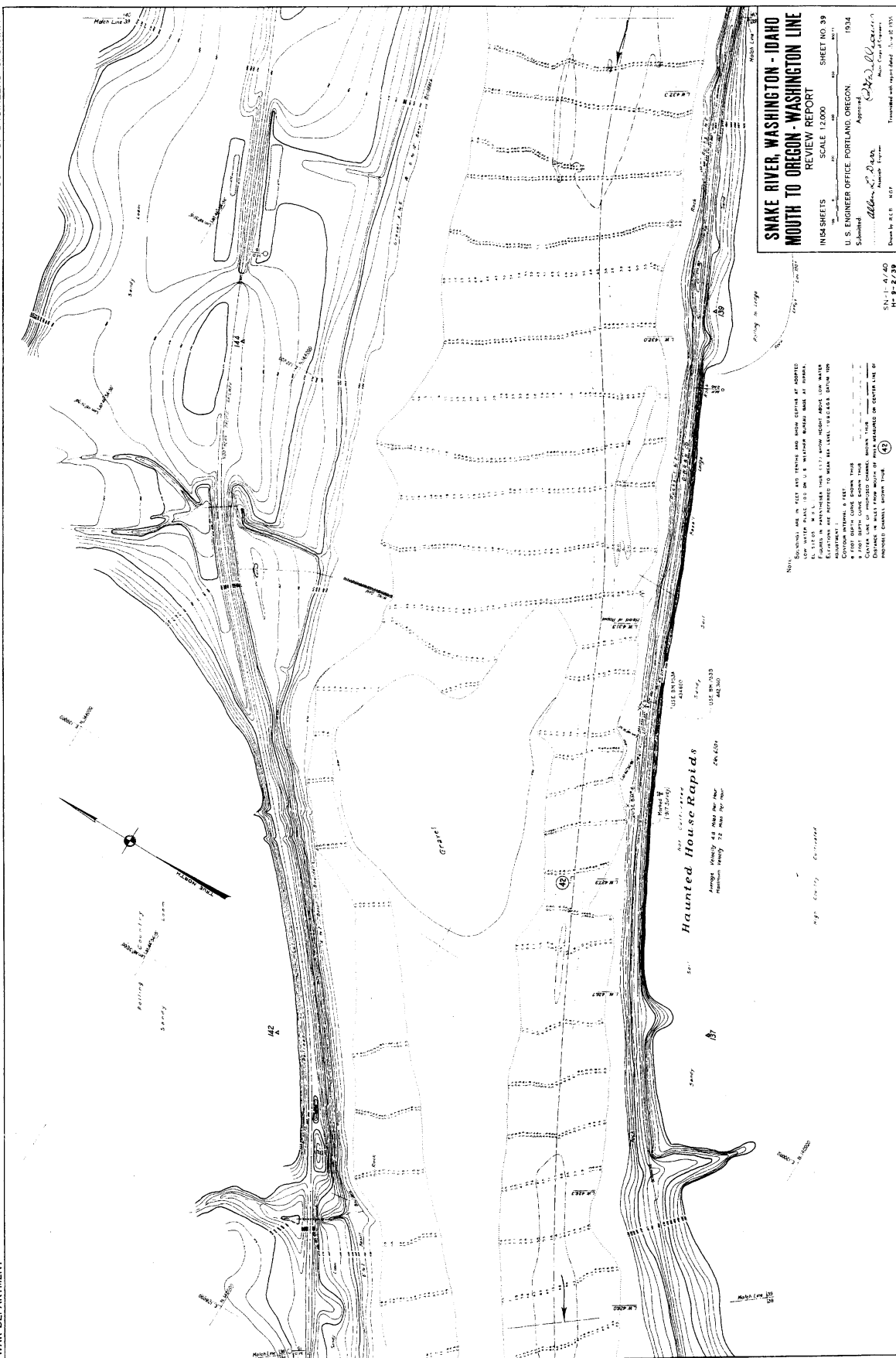
**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

IN 154 SHEETS SCALE 12,000 SHEET NO 36

U. S. ENGINEER OFFICE, PORTLAND, OREGON.

Submitted: *Allen L. Starr*
 Approved: *W. B. Dill, Jr.*
 Member of Council Examiners

Drawn by A.C.H. M.C.T. Transmitted with reagent dated June 12, 1955



**Snake River, Washington - Idaho
Mouth to Oregon - Washington Line**

NIS4 SHEETS SCALE 1:2,000 SHEET NO. 39

U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Submitted: 100 20 20
Approved: [Signature] 00

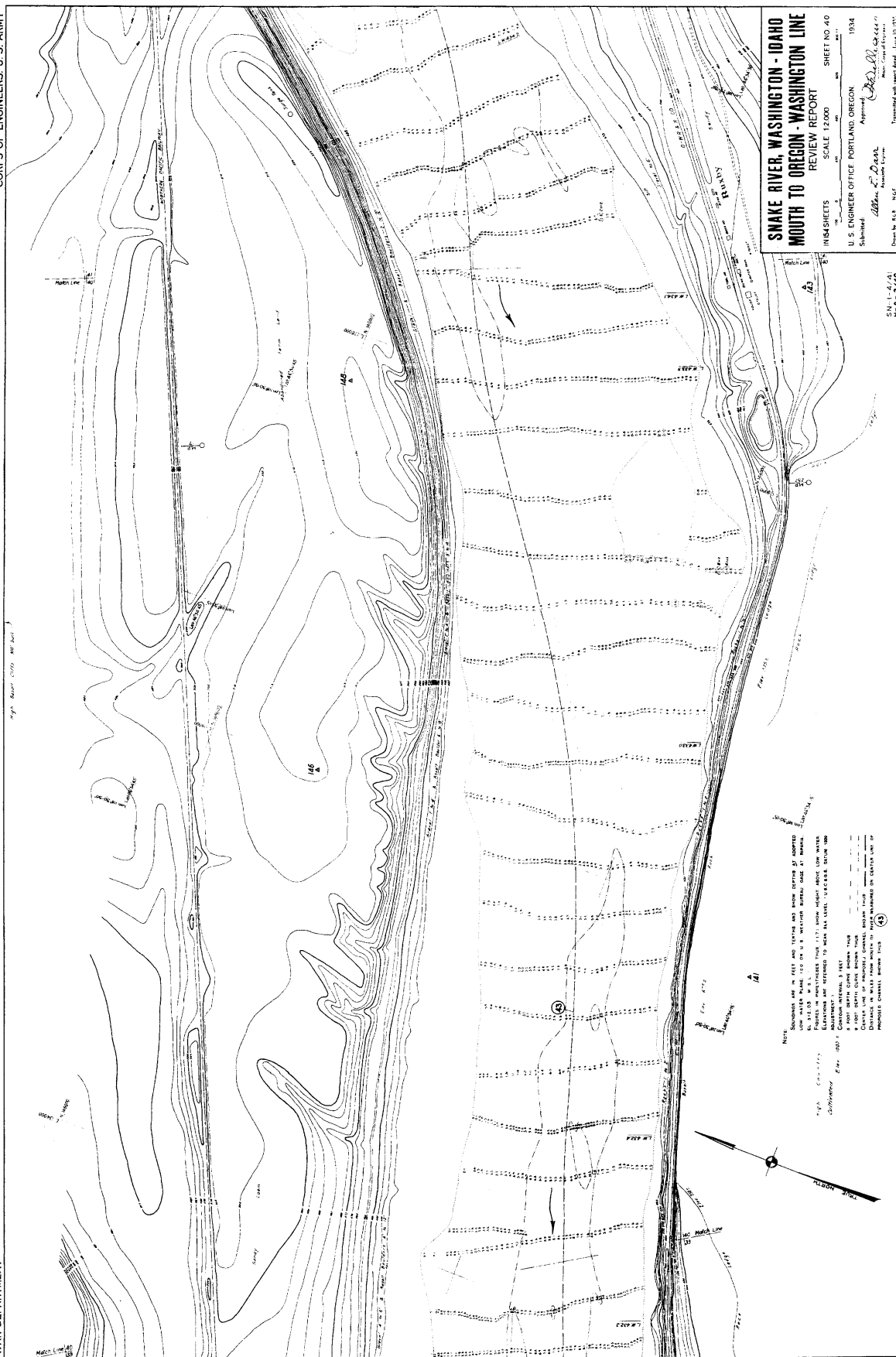
..... Allan R. Starr
Assistant Engineer

Known by R & B N G F
Transmitted with report dated June 10 1935
SN=12739

3
6
7
-
3
1

5N-1-4/40
H-9-2/39

H-9-2/39



**SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE**

REVIEW REPORT

NIS4 SHEETS SCALE 1:2000 SHEET NO. 40

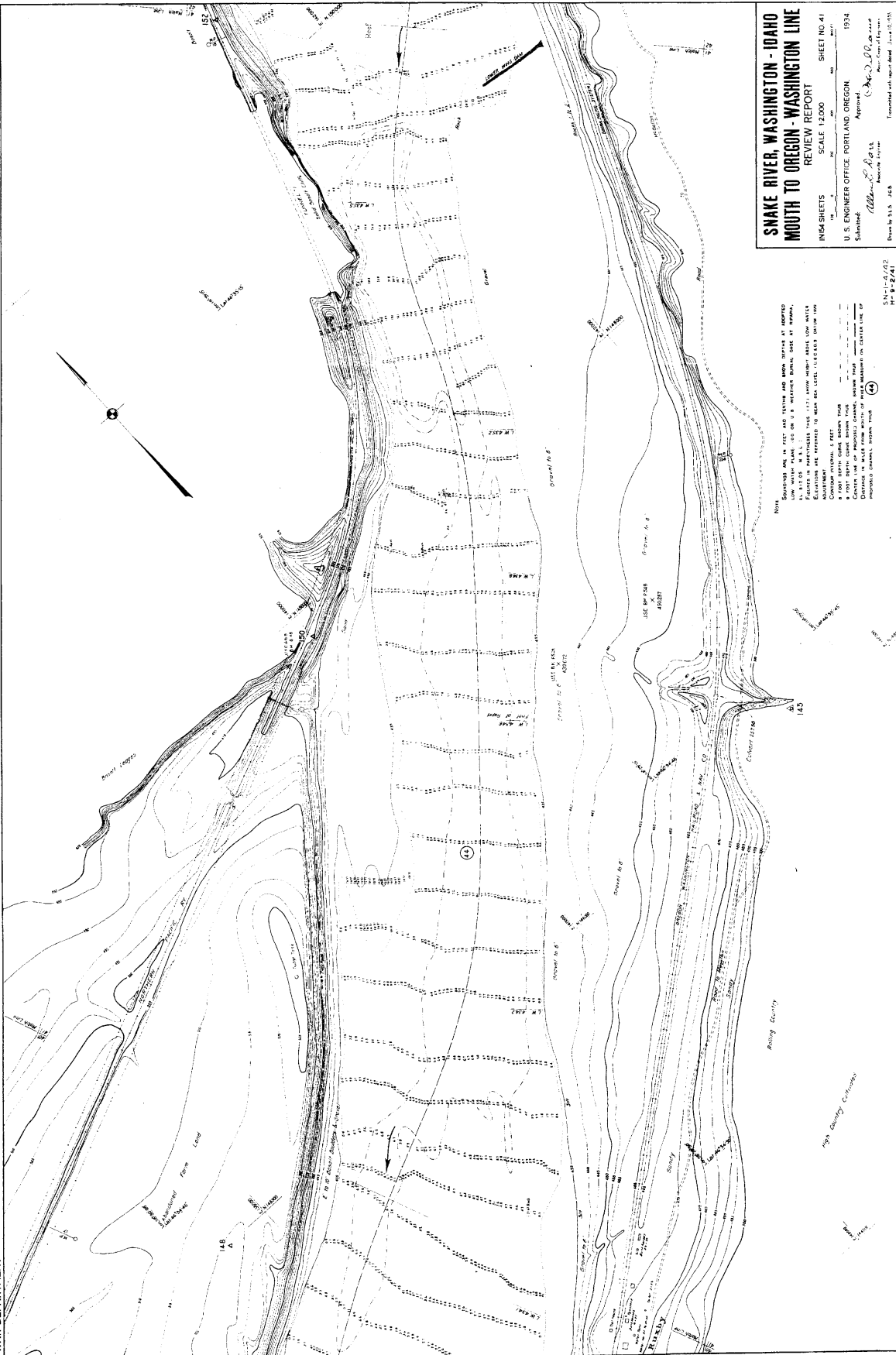
U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Submitted: _____ Approved: *(Signature)* 00

Allen L. Dan
Associate Engineer

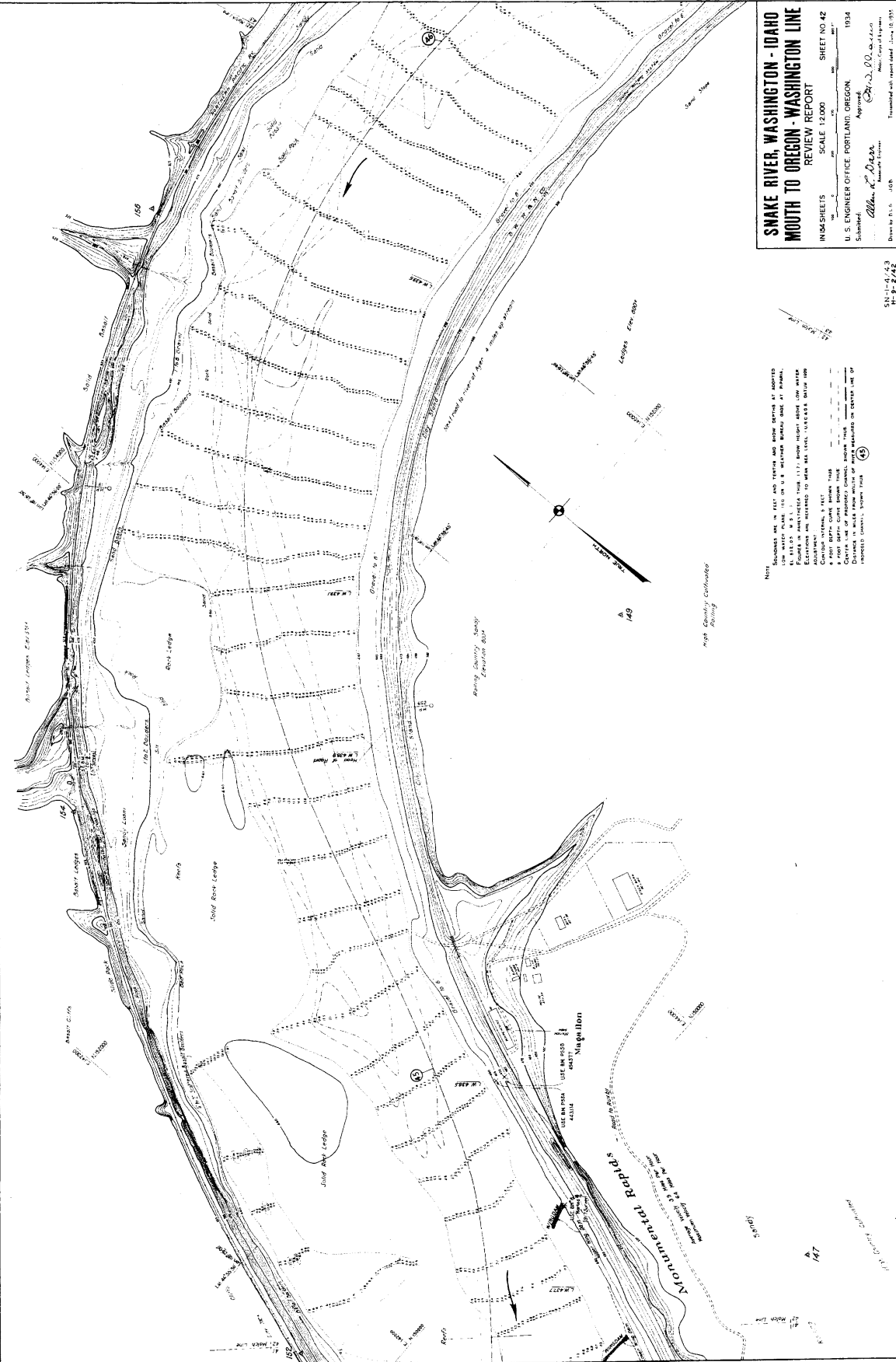
Prepared by RCB NCF
Transmitted with report dated June 10, 1958.

SN-1-12/40



Snake River, Washington - Idaho Mouth to Oregon - Washington Line
REVIEW REPORT
 INDS SHEETS SCALE 12,000 SHEET NO. 41
 U. S. ENGINEER OFFICE, PORTLAND, OREGON
 Submitted: *Arthur S. Hall* Approved: *W. S. Hall*
 1934
 Drawn by: S. S. J. A. B. Transmitted with report dated June 15, 1934
 SN-1-12741

Notes
 Soundings are in feet and tenths and were derived at depths of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, 1700, 1710, 1720, 1730, 1740, 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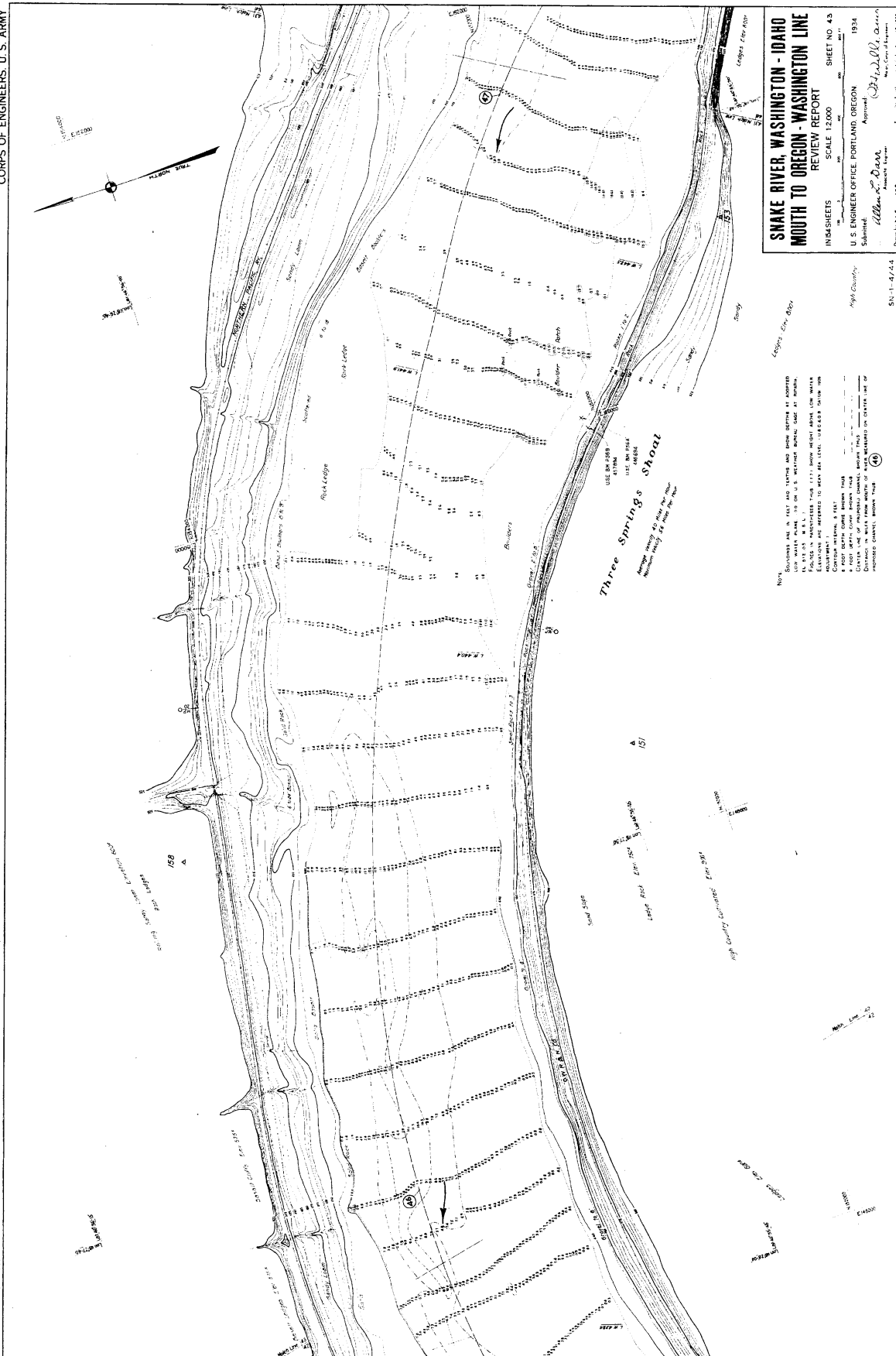


Snake River, Washington - Idaho Mouth to Oregon - Washington Line
REVIEW REPORT
 IN 54 SHEETS SCALE 1:25,000 SHEET NO. 42
 U. S. ENGINEER OFFICE PORTLAND, OREGON, 1934
 Submitted: *Wm. A. Dyer* Approved: *Wm. A. Dyer*
 Drawn by: D. L. J. 10th
 Transmitted and report dated: June 10, 1935

Notes:
 1. Soundings are in feet and tenths and were derived by adopted low water plane, 100 on U. S. Engineer's datum at mouth of river.
 2. Elevation of water surface at mouth of river is 100 feet above datum.
 3. Elevation of water surface at mouth of river is 100 feet above datum.
 4. Elevation of water surface at mouth of river is 100 feet above datum.
 5. Elevation of water surface at mouth of river is 100 feet above datum.
 6. Elevation of water surface at mouth of river is 100 feet above datum.
 7. Elevation of water surface at mouth of river is 100 feet above datum.
 8. Elevation of water surface at mouth of river is 100 feet above datum.
 9. Elevation of water surface at mouth of river is 100 feet above datum.
 10. Elevation of water surface at mouth of river is 100 feet above datum.

SN-1-4-42
 10-2-42

SN-1-12/42

[illegible]

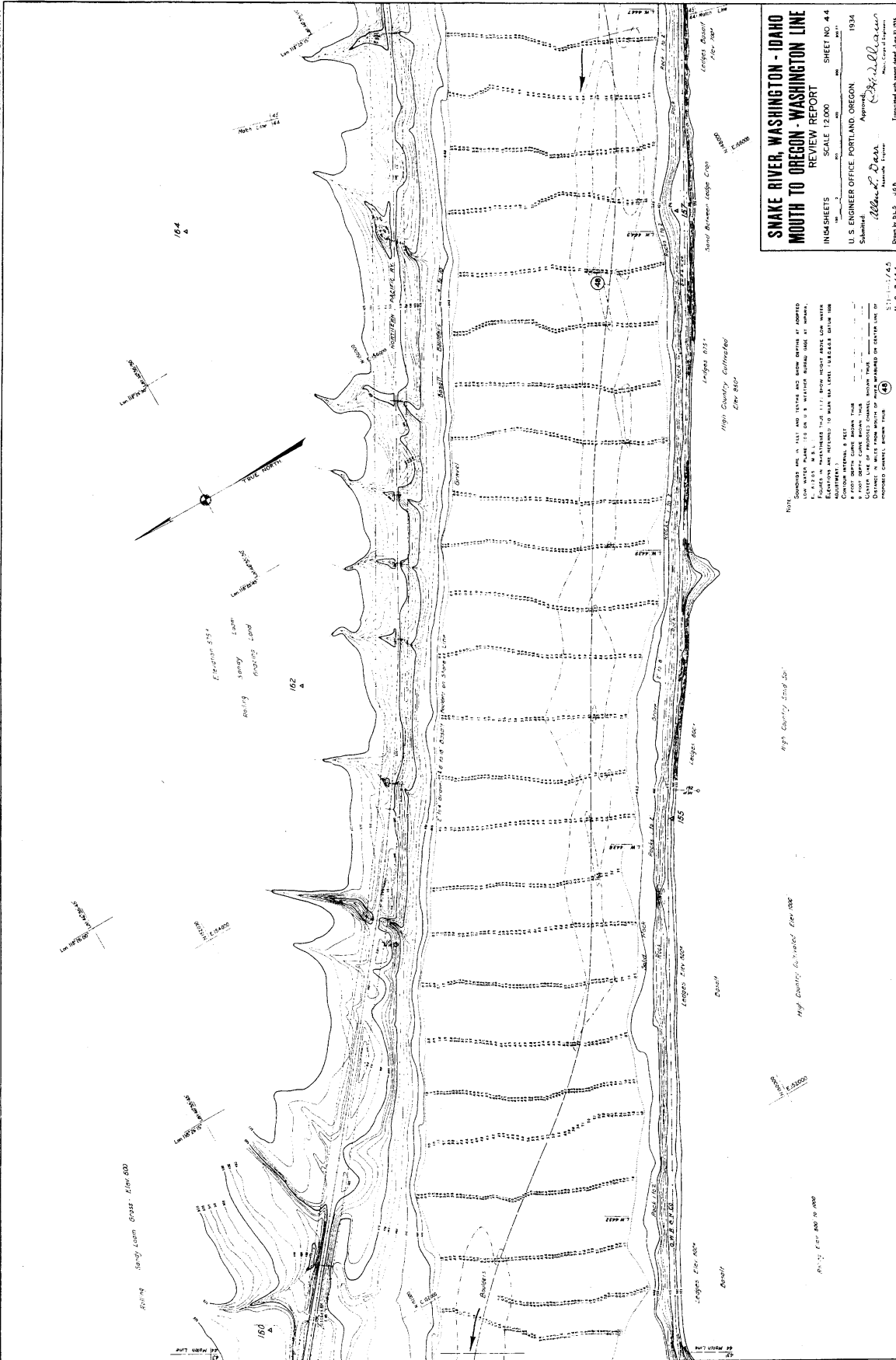
54
SNAKE RIVER, WASHINGTON - IDAHO
MOUTH TO OREGON - WASHINGTON LINE
 REVIEW REPORT
 SCALE 1:2000
 SHEET NO. 43
 IN 54 SHEETS

U. S. ENGINEER OFFICE, PORTLAND, OREGON. 1934

Submitted: *Allen L. Darr*
Associate Engineer

Approved: *W. H. Little, Assoc.*
Major Corps of Engineers

SN-1-12/43



Annex B
PRE- AND POST-DAM COMPARISON DISPLAYS

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Ice Harbor

3 Island & Levey Park Area
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The Narrows Area
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Windust Park Area

Lower Monumental

Monumental Rock Area
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Ayer Area
55 Mile Area
Lyon's Ferry Area
Tucannon River Confluence Area
Riparia Area

Little Goose

Little Goose Dam Area
Goose Island Area
New York Bar Area
Willow Bar Area
Penawawa Area
Shultz Bar Area
Atwood Area
Almota Area

Lower Granite

Lower Granite Dam Area



1958 aerial photograph of 3 Island and Levey Park area.



1991 aerial photograph of 3 Island and Levey Park area.

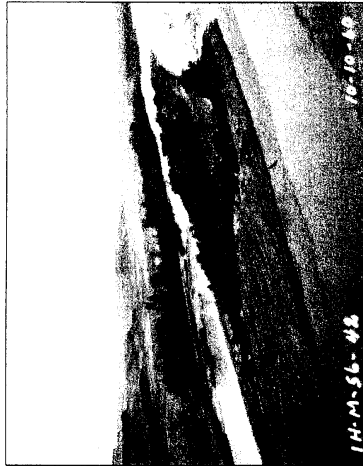


Photo 1. Left Bank, 3 Island area, 1958 oblique.

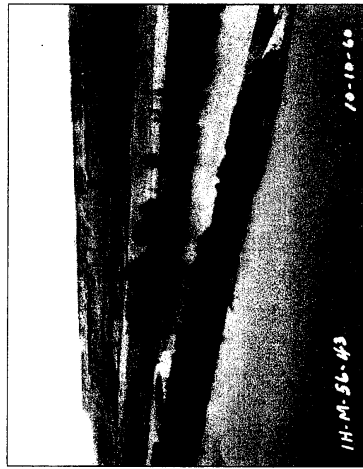


Photo 2. Left Bank, 3 Island area, 1958 oblique.

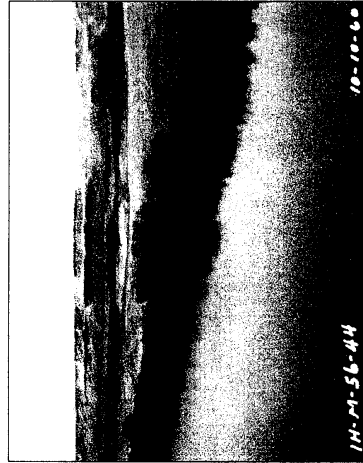
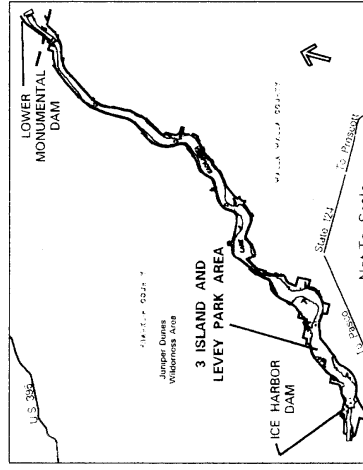
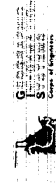


Photo 3. Left Bank, 3 Island area, 1958 oblique.



12/7/5

1. Numbered areas on 1958 aerial photograph indicate represents boundaries location and direction of oblique photograph. Number represents numbered oblique image.



DRAFT
LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

3 Island & Levey Park Area PRE & POST DAM COMPARISON

1999



1991 aerial photograph of 19 Mile and Fish Hook Park area.

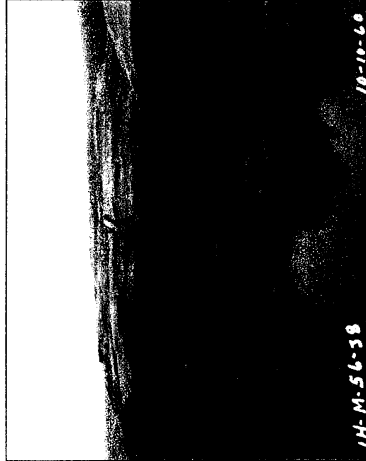
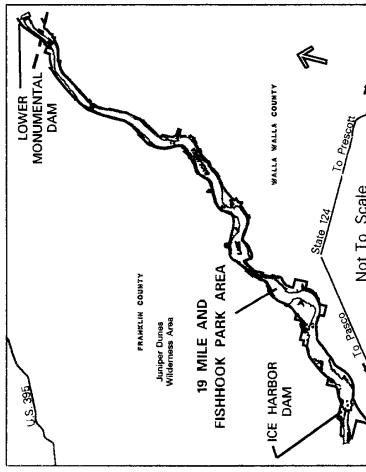
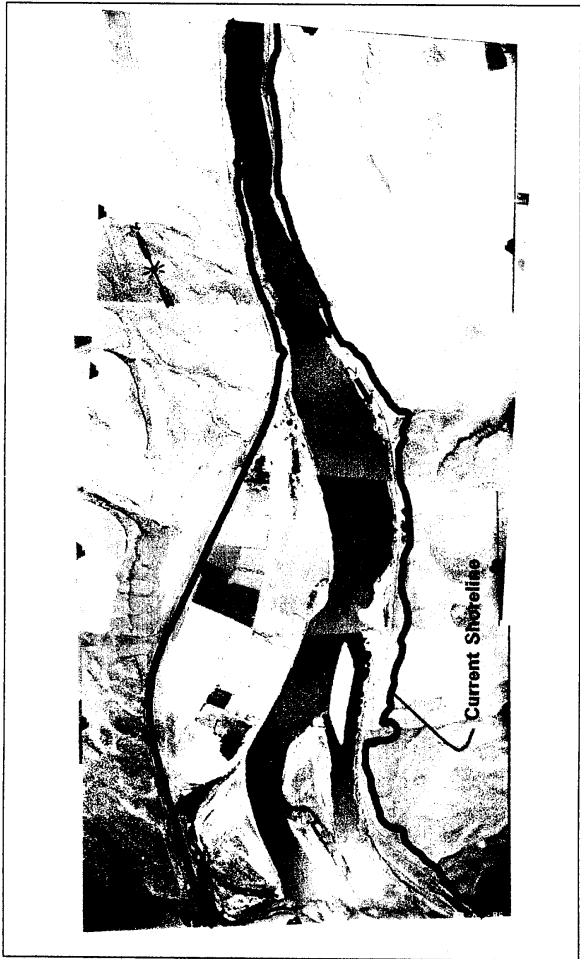


Photo 3. Left Bank, 19 Mile area, 1958 oblique.



1958 aerial photograph of 19 Mile and Fish Hook Park area.

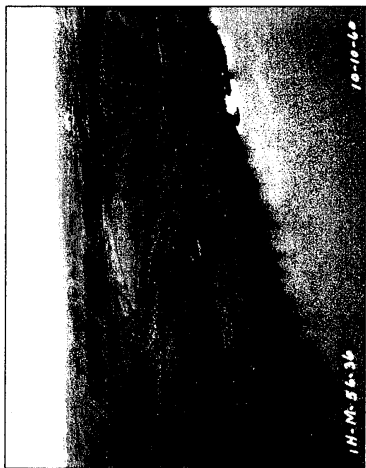


Photo 2. Left Bank, 19 Mile area, 1958 oblique.

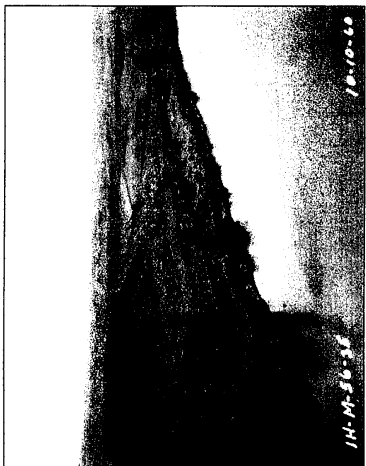


Photo 1. Left Bank, 19 Mile area, 1958 oblique.

NOTES:

1. Numbered arrows on 1958 aerial photograph indicate approximate location and direction of oblique photography. Number represents numbered oblique image.
- 2.

Sheet 1444



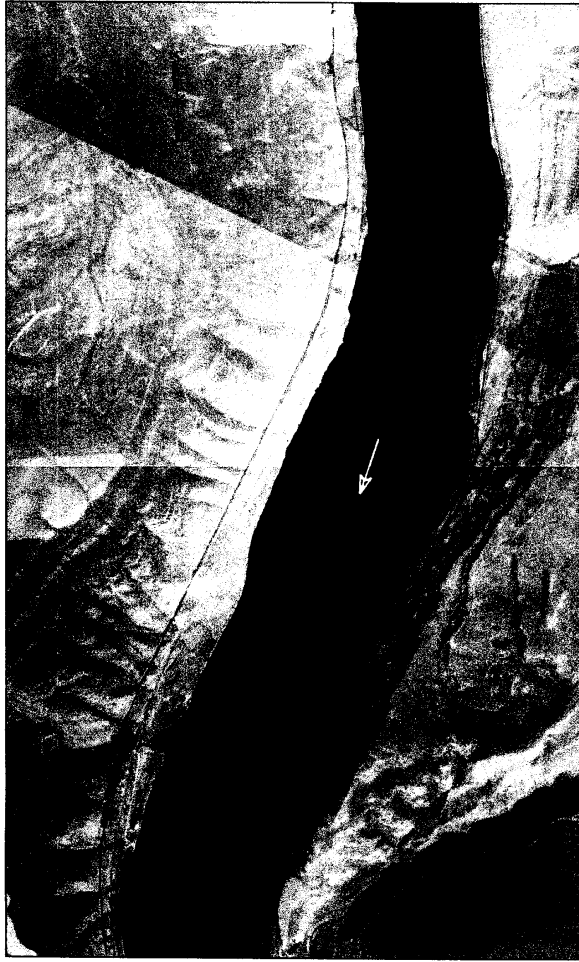
DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

19 Mile & Fish Hook Park Area PRE & POST DAM COMPARISON

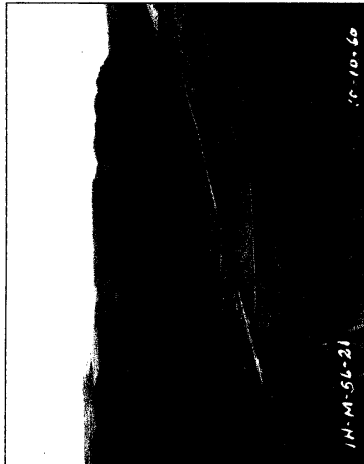
1991 Aerial Photograph by [illegible]
1958 Oblique Photographs by [illegible]
Map by [illegible]
FUTURES 19-0401-WB 10/27



1958 aerial photograph of Couch Island area.



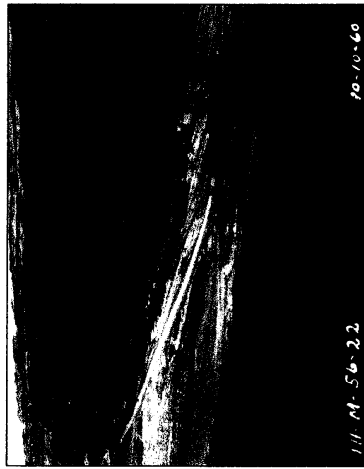
1991 aerial photograph of Couch Island area.



14-M-56-21

10-10-60

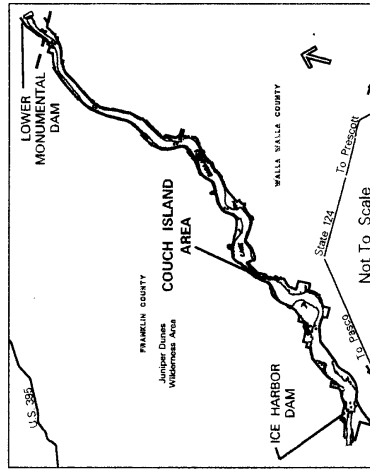
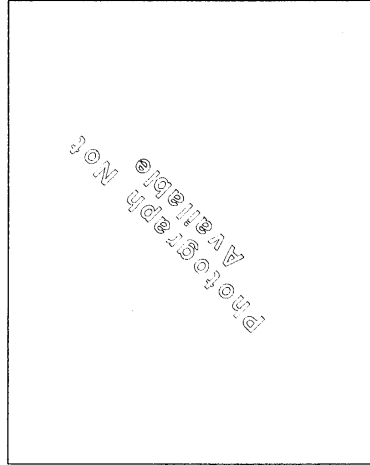
Photo 1. Left Bank, Couch Island area, 1958 oblique.



14-M-56-22

10-10-60

Photo 2. Left Bank, Couch Island area, 1958 oblique.



NOTES

1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.
- 2.

See page 10

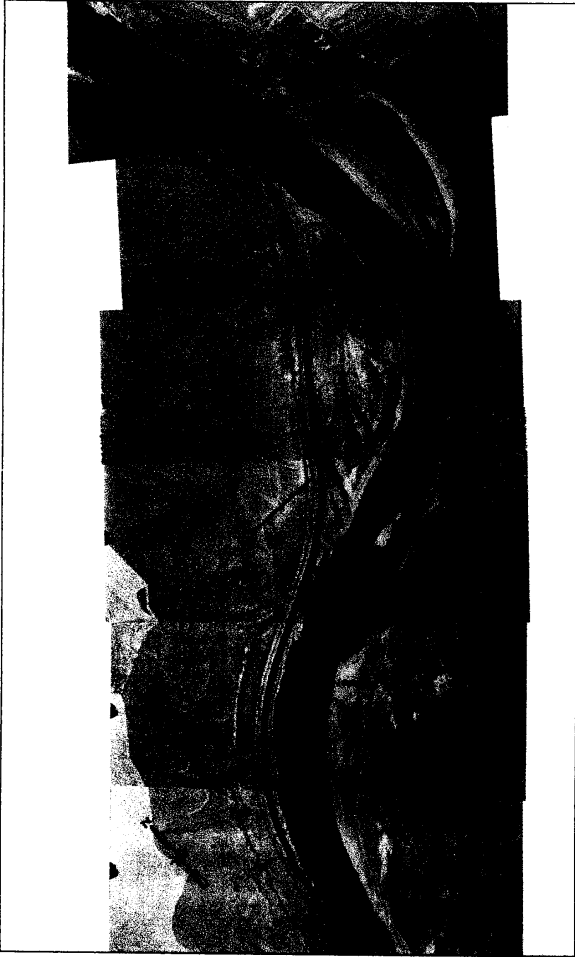


DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

Couch Island Area **PRE & POST DAM COMPARISON**

Prepared by: J. R. Galt, J. R. Galt & Associates, Inc., 1000 N. 1st St., P.O. Box 1000, Lewiston, ID 83501
Contract No. 10-10-60
Date: 10-10-60
Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Map No. 10-10-60-13-10

1959



1958 aerial photograph mosaic of Sheffler area.



1991 aerial photograph of Sheffler area.



Photo 1. Left Bank, Sheffler area, 1958 oblique.



Photo 2. Left Bank, Sheffler area, 1958 oblique.

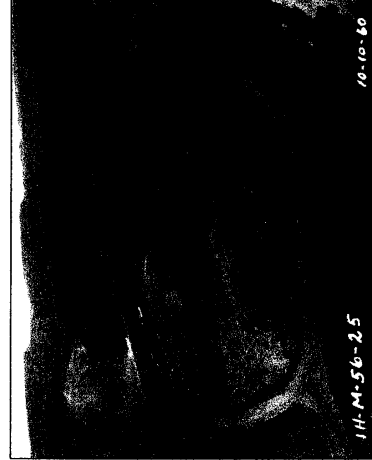
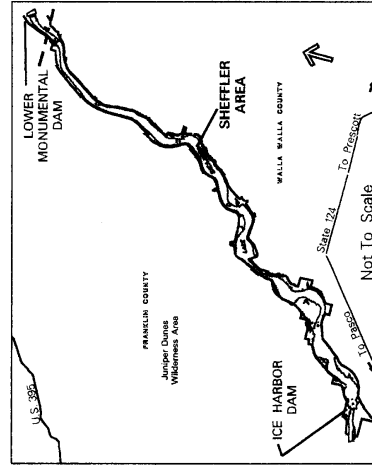


Photo 3. Left Bank, Sheffler area, 1958 oblique.



NOTES:

1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.
- 2.

Scale 1:441



DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

PRE & POST DAM Sheffler Area COMPARISON

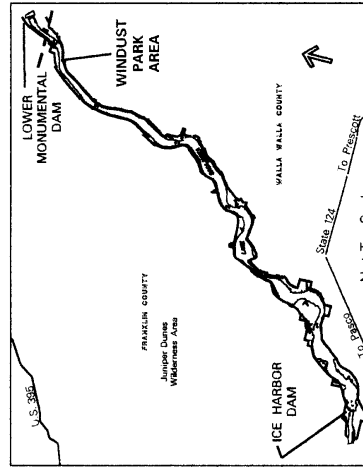
PROJECTED: 23 MAY 1988 11:17
1999



1991 aerial photography of Windust Park area.



Photo 2. Left Bank, Windust Park area, 1958 oblique.



DRAFT

LOWER SNAKE RIVER

Juvenile Salmon Migration Feasibility Study

GEORGE W. COLE
LAND CONSULTING
513-383-1338
www.georgewcole.com

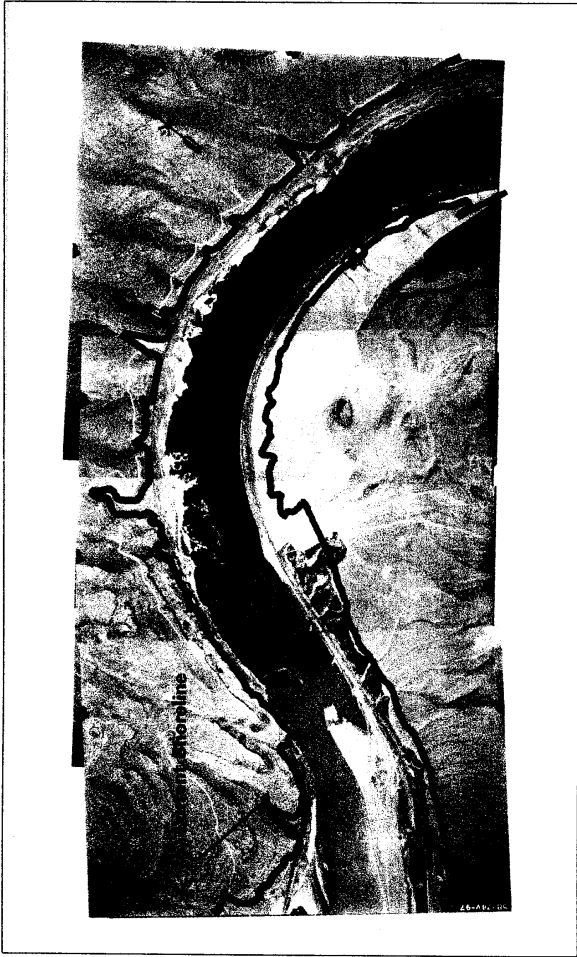
Wade Wayne Sparks



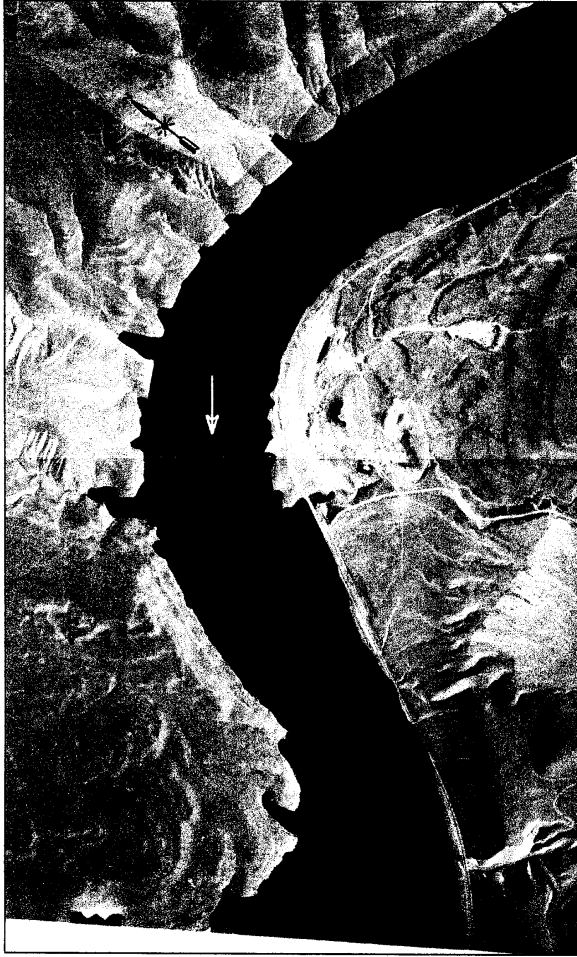
Windust Park Area POST DAM COMPARISON 1999

1999

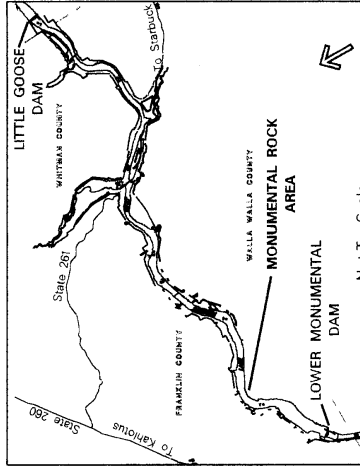
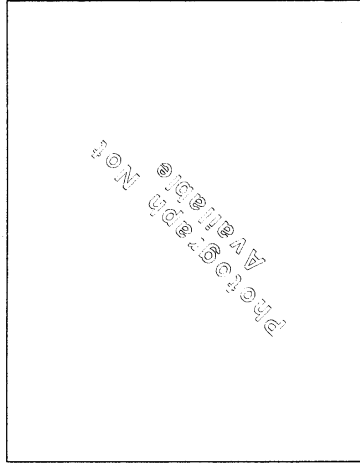
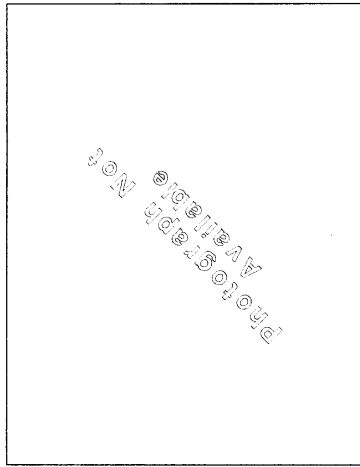
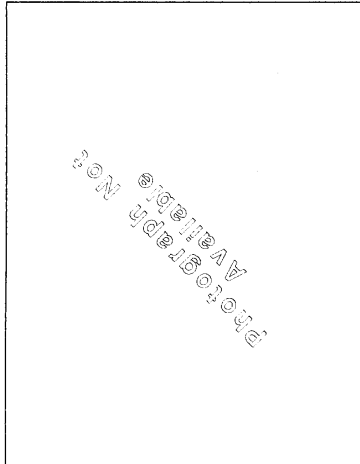
1999



1958 aerial photograph of Monumental Rock area.



1992 aerial photograph of Monumental Rock area.



NOTES:
1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.

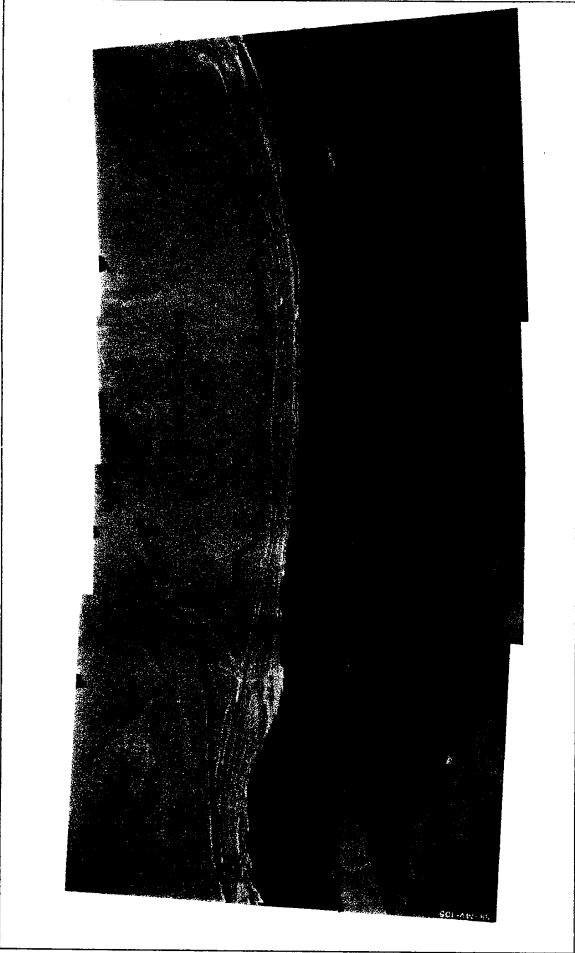
Sheet 1004



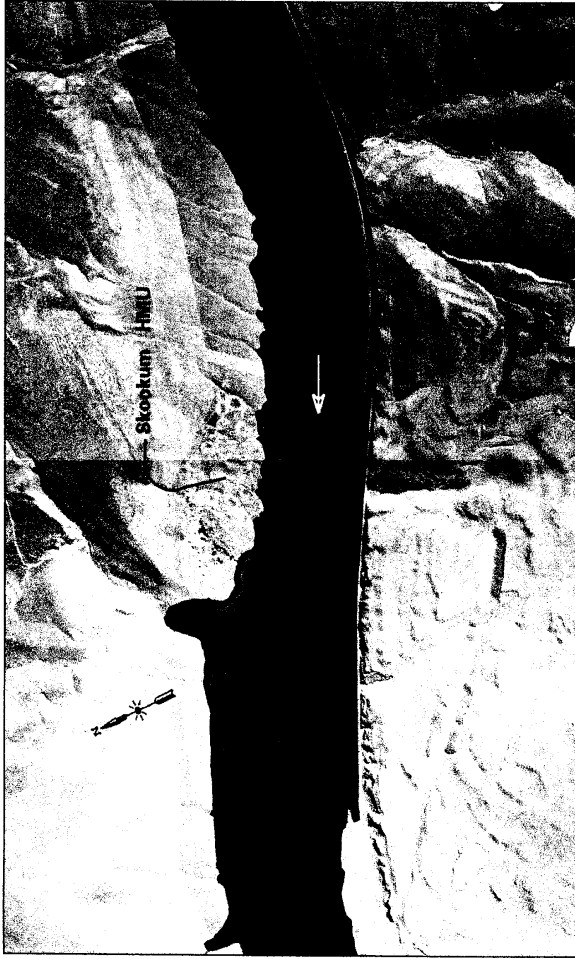
DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

Monumental Rock Area PRE & POST DAM COMPARISON

U.S. GEOLOGICAL SURVEY
BIOLOGICAL RESOURCE DIVISION
SANDY, IDAHO 83201
PLATTED 23 MAY 1989 1:8



1958 aerial photograph mosaic of Skookum area.



1992 aerial photograph mosaic of Skookum area.



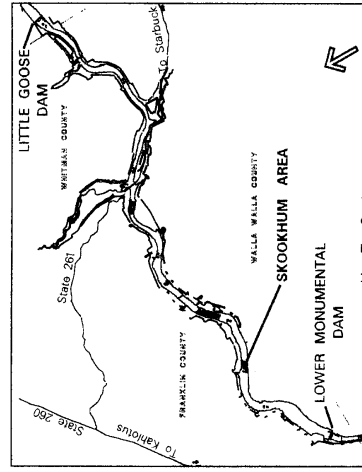
Photo 1. Right Bank, Skookum area, 1958 oblique.



Photo 2. Left Bank, Skookum area, 1958 oblique.



Photo 3. Left Bank, Skookum area, 1958 oblique.



NOTES

1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.
- 2.

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Juvenile Salmon Migration Feasibility Study

PRE & POST DAM Skookum Area COMPARISON

Small text block, likely a page number or reference.

Small text block, likely a page number or reference.



1958 aerial photograph of Ayer area.



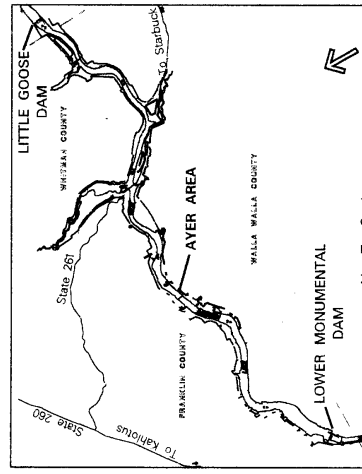
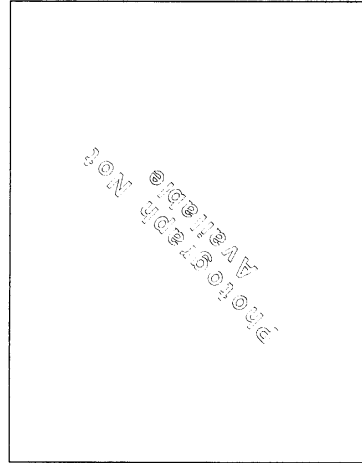
1992 aerial photograph of Ayer area.



Photo 1. Right Bank, Ayer area, 1958 oblique.



Photo 2. Left Bank, Ayer area, 1958 oblique.



NOTES:

1. Numbered arrows on 1958 aerial photograph mosaic: represents approximate location and direction of oblique photography. Number represents numbered oblique image.
- 2.

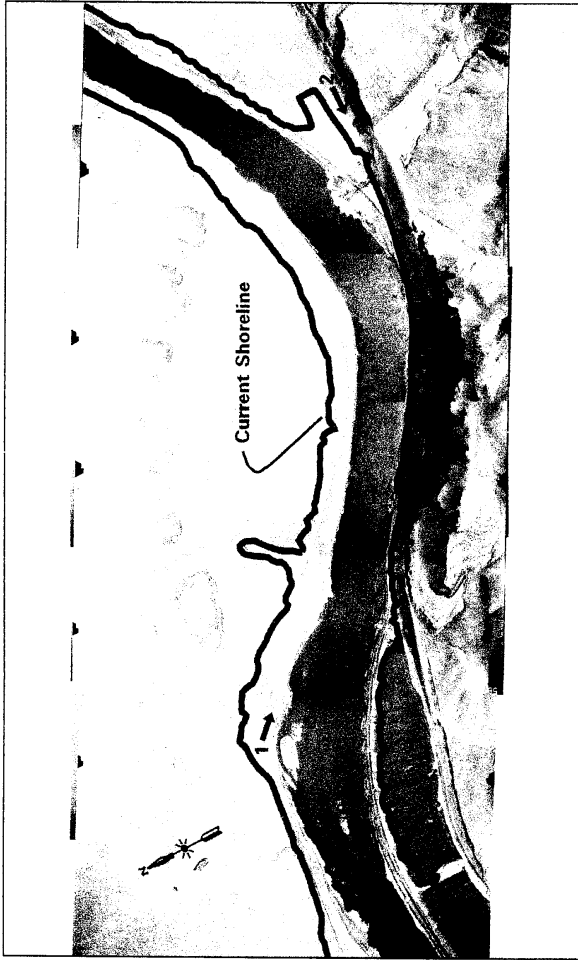
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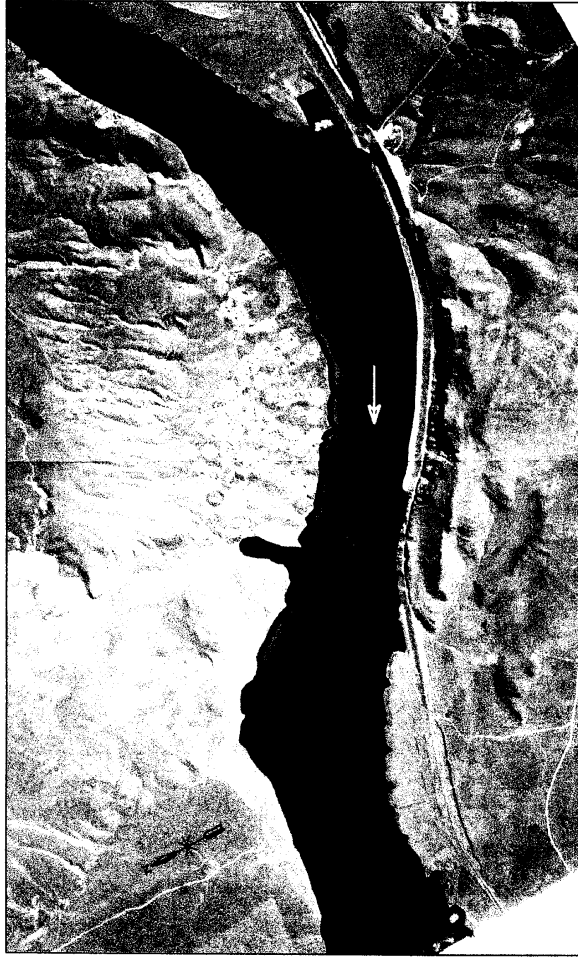
DRAFT
LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

PRE & POST DAM Ayer Area COMPARISON

Prepared by: Geographic Information Systems Center
U.S. Department of the Interior
Bureau of Reclamation
Snake River Watershed
P.O. Box 1000
Idaho Falls, Idaho 83401
PLOTTED 22-JUL-1998 11:18



1958 aerial photograph of 55 Mile area.



1992 aerial photograph of 55 Mile area.



Photo 1. Right Bank, 55 Mile area, 1958 oblique.



Photo 2. Left Bank, 55 Mile area, 1958 oblique.

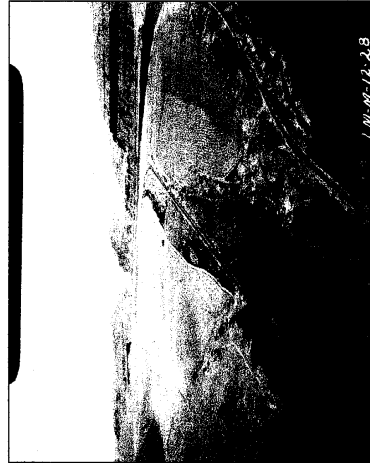
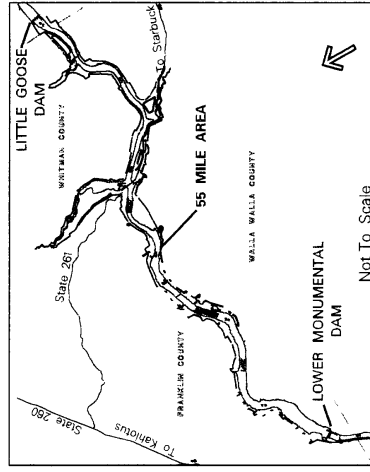


Photo 3. Left Bank, 55 Mile area, 1958 oblique.



- NOTES
1. Numbered arrows on 1958 aerial photograph indicate approximate location and direction of oblique photography. Number represents numbered oblique image.
 - 2.

Source:



DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

55 Mile Area PRE & POST DAM COMPARISON

PROJECT 72-100-000-13.9
1999

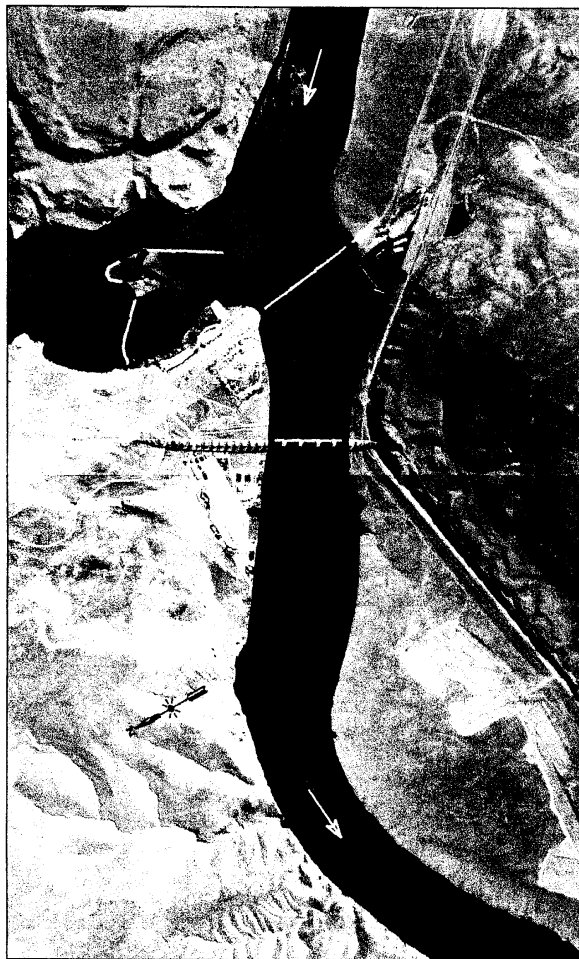


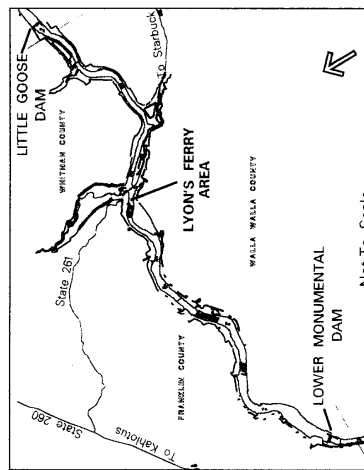
Photo 1. Right Bank, Lyon's Ferry area, 1958 oblique.



Photo 2. Right Bank, Lyon's Ferry area, 1958 oblique.



3. Left Bank, Lyon's Ferry area, 1958 oblique.



NOTES:

1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.

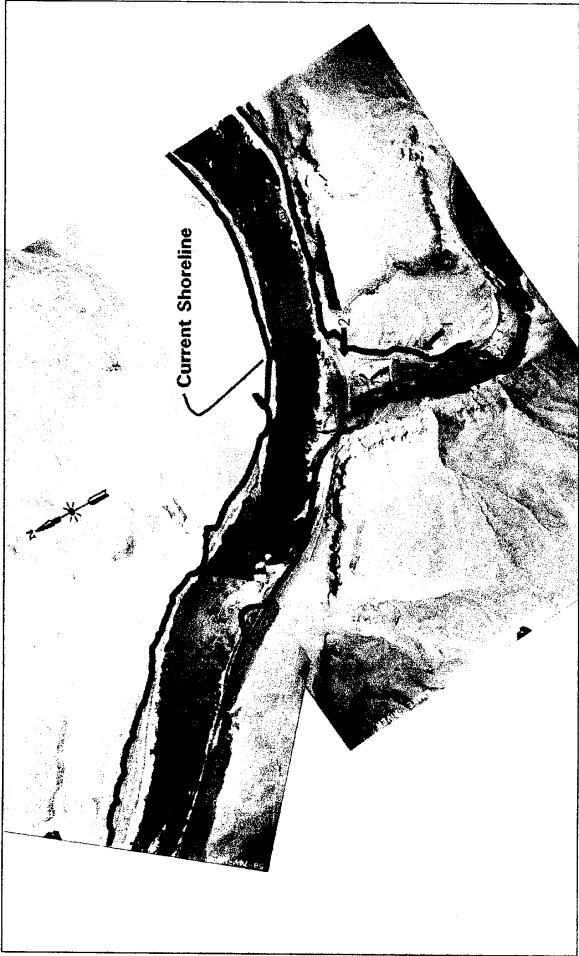
2

DRAFT **LOWER SNAKE RIVER**
Juvenile Salmon Migration Feasibility Study

PRE & POST DAM COMPARISON

Q5 Analyst & Growth Assembly Applied Technology Team (22 April 2014) (Q5-A1)
Q5 Applications Coordinator, Blue Green (22 June 2014) (Q5-A2)
Study Manager, Blue Green (22 June 2014) (Q5-A3)

1999



1958 aerial photograph of Tucannon River Confluence area.



1992 aerial photograph of Tucannon River Confluence area.



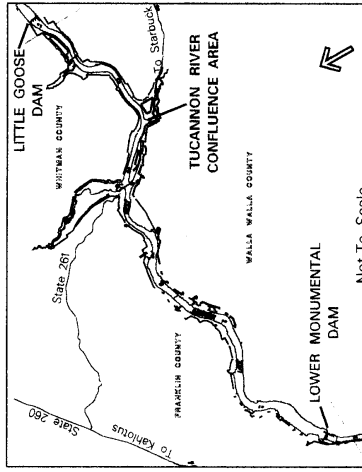
Photo 1. Left Bank, Tucannon River area, 1958 oblique.



Photo 2. Left Bank, Tucannon River area, 1958 oblique.



Photo 3. Left Bank, Tucannon River area, 1958 oblique.



NOTES:
1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.

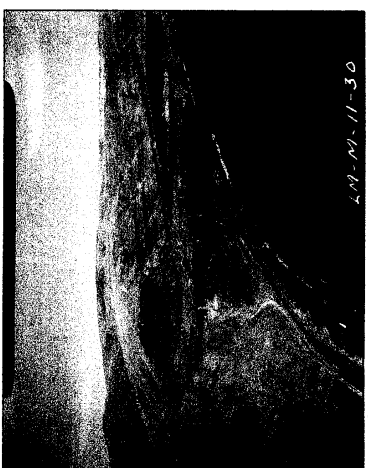
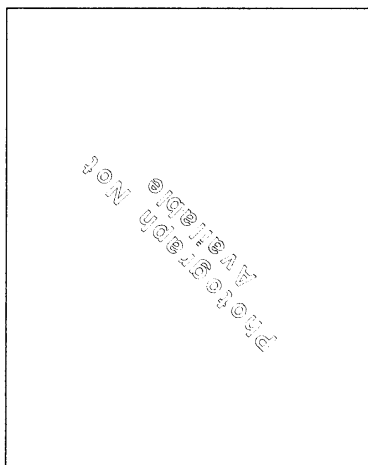
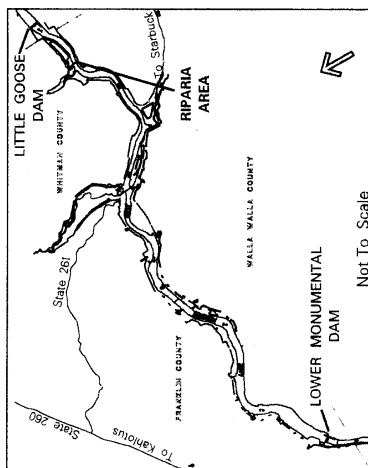
Source:



DRAFT LOWER SNAKE RIVER Juvenile Salmon Migration Feasibility Study **Tucannon River Confluence Area** **PRE & POST DAM** **COMPARISON**

BY: ANDREW J. GILSON, LANDSCAPE ARCHITECT, 10000 1st Ave. SW, #200, Seattle, WA 98148
DATE: 10/10/00
PROJECT: Lower Snake River Juvenile Salmon Migration Feasibility Study
PROJECT NUMBER: 10000 1st Ave. SW, #200, Seattle, WA 98148

PLATTED DATE: 10/10/00



NOTES:

- i. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.

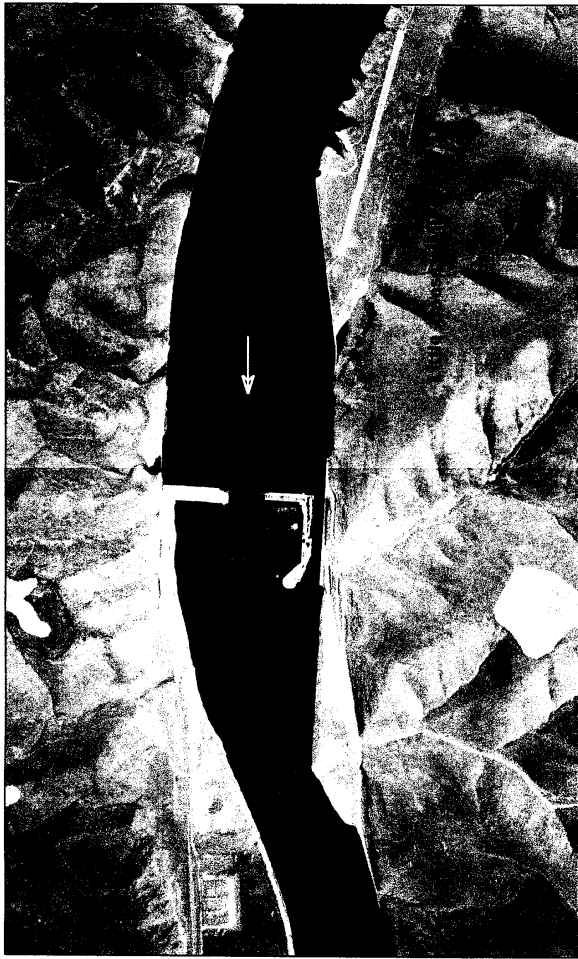
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DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

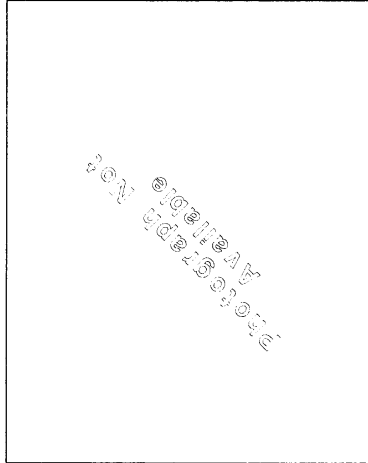
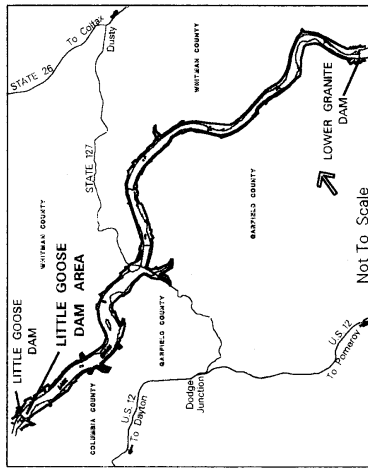
PRE & POST DAM COMPARISON

¹⁵ Andy B. & J. 2006. Assistant Applied Technology Team (C2006-04-01) (A.T.).
¹⁶ Applications Coordinator, John D. (C2006-04-01) (A.T.).
¹⁷ Study Manager, John D. (C2006-04-01) (A.T.).
¹⁸ C2006-04-01 (A.T.).

1999



1992 aerial photograph of Little Goose Dam area.



Source:

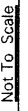
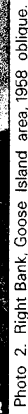
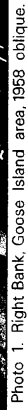
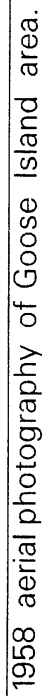
- NOTES:
1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.
 - 2.

Photo 1. Right Bank, Little Goose Dam area, 1958 oblique.

Photo 2. Right Bank, Little Goose Dam area, 1958 oblique.

DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study
Little Goose Dam Area
PRE & POST DAM
COMPARISON
1999

Prepared by: BENTLEY & BENTLEY, INC.
1000 N. 10th Street, Suite 100
Coeur d'Alene, ID 83814
Phone: (208) 765-1111
Fax: (208) 765-1112
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Project: Lower Snake River Juvenile Salmon Migration Feasibility Study
Project Number: 1999-01
Project Date: 1999-01-15



1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.



Goose Island Area PRE & POST DAM & COMPARISON

Q15: *Analysis & Synthesis Applied Technology Team (CS) under the PD-EAT;*
Q16: *Applications Coordinator, Global Sales (CS) under the PD-EAT;*
Study manager, *Wolke O'Brien, CS under the PD-EAT;*
Q17: *Business Development Sales (CS) under the PD-EAT;*

PL01110: 22-MAY-1999 13:50



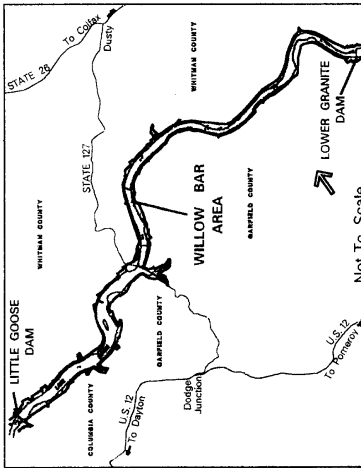
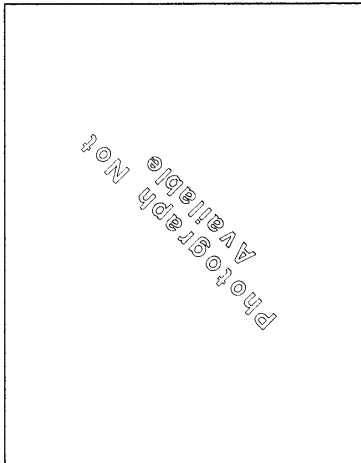
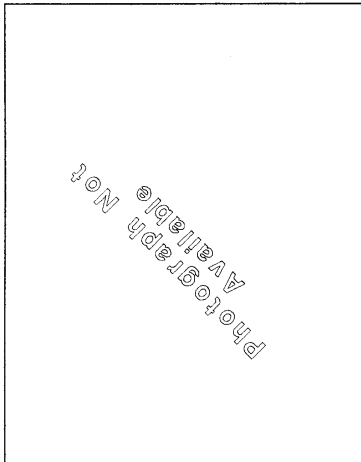
1958 aerial photography of Willow Bar area.



1992 aerial photography of Willow Bar area.



Photo 1. Right Bank, Willow Bar area, 1958 oblique.



NOTES:

1. Numbered arrows on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents numbered oblique image.

DRAFT **LOWER SNAKE RIVER**
Juvenile Salmon Migration Feasibility Study

Willow Bar Area PRE & POST DAM COMPARISON

Study Manager: Nadia Gordon (N.Gordon@uic.edu)
 Study Coordinator: Blythe Gordon (B.Gordon@uic.edu)
 Study Manager: Nadia Gordon (N.Gordon@uic.edu)
 Study Coordinator: Blythe Gordon (B.Gordon@uic.edu)

PLOTTED: 22-NOV-2009 16:24



1958 aerial photograph of Shultz Bar area.



1992 aerial photograph of Shultz Bar area.



Photo 1. Right Bank, Shultz Bar area, 1958 oblique.

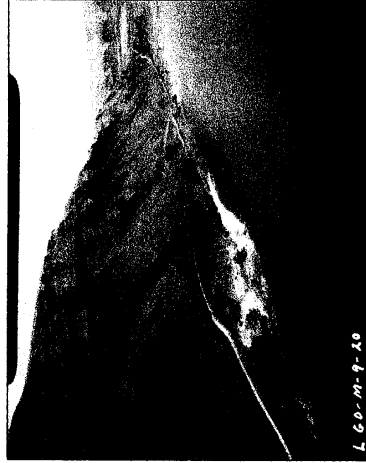
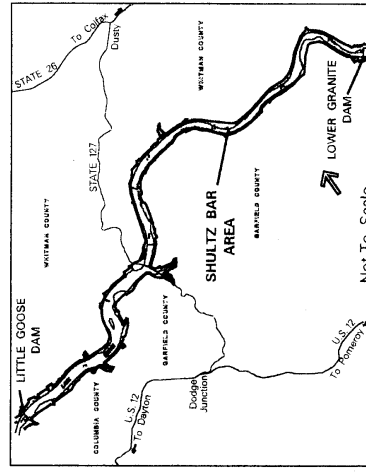


Photo 2. Left Bank, Shultz Bar area, 1958 oblique.



Photo 3. Left Bank, Shultz Bar area, 1958 oblique.

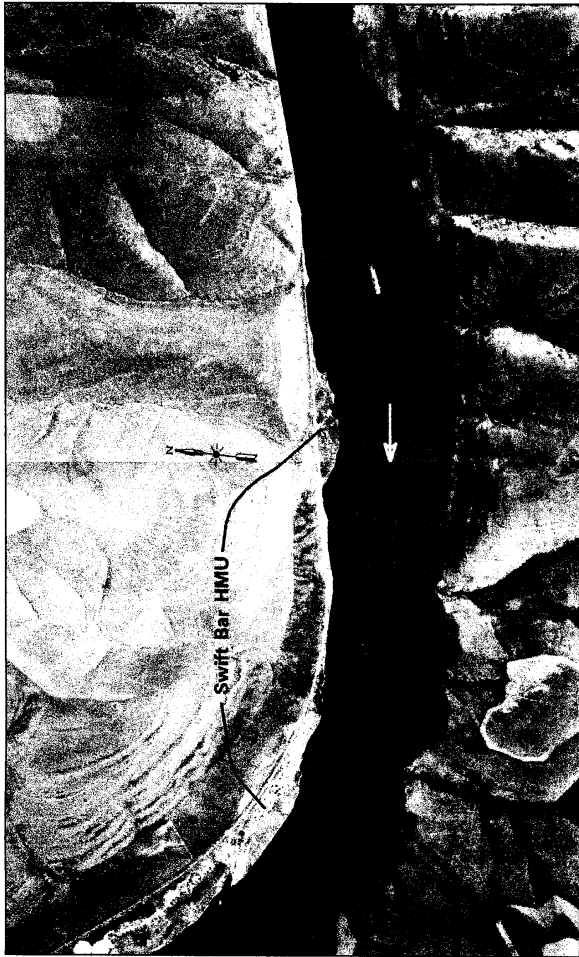


NOTES:
1. Numbered arrows on 1958 aerial photograph mosaic: represents approximate location and direction of oblique photography. Number represents numbered oblique image.
2.

DRAFT
LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study
Shultz Bar Area
PRE & POST DAM
COMPARISON
1999
PROJECT 23-4671-0000-10-00



1958 aerial photograph of Atwood area.



1992 aerial photograph of Atwood area.



Photo 1. Right Bank, Atwood area, 1958 oblique.



Photo 2. Right Bank, Atwood area, 1958 oblique.

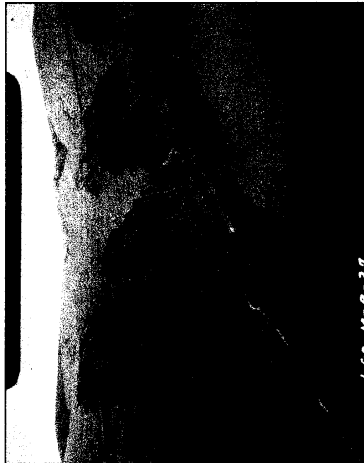
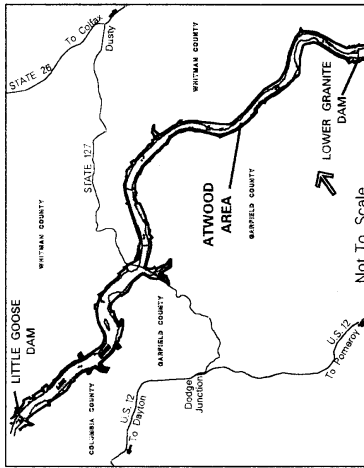


Photo 3. Left Bank, Atwood area, 1958 oblique.



NOTES:
1. Numbered arrows on 1958 aerial photograph indicate approximate location and direction of oblique photography. Number represents numbered oblique image.

Source:



DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

PRE & POST DAM Atwood Area COMPARISON

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SALT LAKE CITY, UTAH 84143
PROJECT 22-001-008-014
1989



1958 aerial photograph of Almota area.



1992 aerial photograph of Almota area.



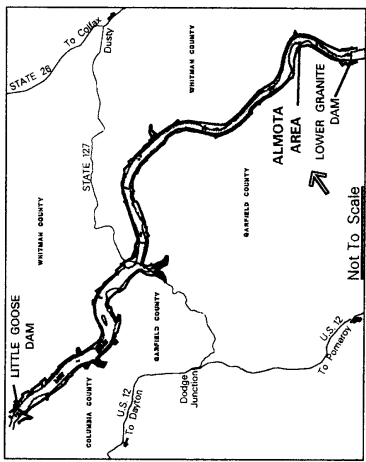
Photo 1. Right Bank, Almota area, 1958 oblique.



Photo 2. Left Bank, Almota area, 1958 oblique.



Photo 3. Left Bank, Almota area, 1958 oblique.



NOTES:
1. Northward arrow on 1958 aerial photograph mosaic represents approximate location and direction of oblique photography. Number represents photograph image.
2.

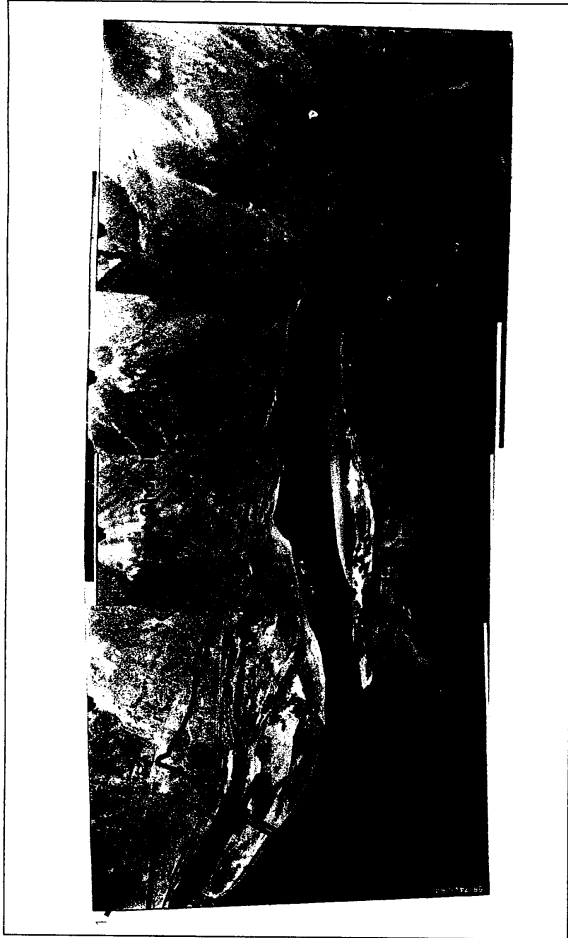


DRAFT LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

Almota Area PRE & POST DAM COMPARISON

1999

Prepared by: GEORGE W. HARRIS & ASSOCIATES, INC.
1000 N. 10th St., Lewiston, ID 83501
208-793-1111
GWHARRIS@GWHARRIS.COM



1958 aerial photograph of Lower Granite Dam area.



Photo 1. Right Bank, Lower Granite Dam area, 1958 oblique.



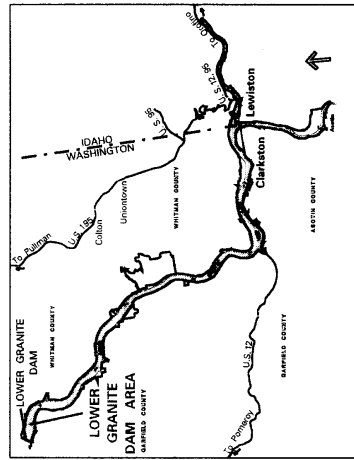
Photo 2. Right Bank, Lower Granite Dam area, 1958 oblique.



1992 aerial photograph of Lower Granite Dam area.



Photo 3. Left Bank, Lower Granite Dam area, 1958 oblique.



NOTES:
1. Numbered arrows on 1958 aerial photograph (table) represents approximate location and direction of oblique photography. Number represents numbered oblique image.
2.

Series



LOWER SNAKE RIVER
Juvenile Salmon Migration Feasibility Study

Lower Granite Dam Area PRE & POST DAM COMPARISON

U.S. GEOLOGICAL SURVEY
BIOLOGICAL SERVICES
BENTON, IDAHO
PLOTTED 27 JAN. 1998 11:18